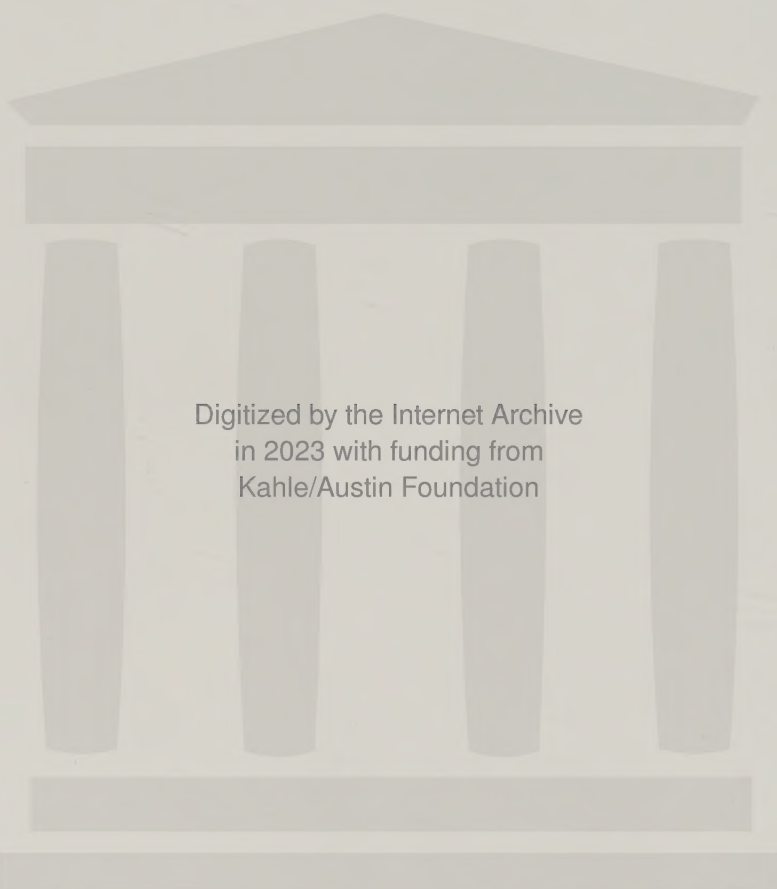


## Solar Physics

*Subject Index and Name Index*  
(Volumes 126–131)



Digitized by the Internet Archive  
in 2023 with funding from  
Kahle/Austin Foundation

*Subject Index – Volumes 126–131*

## Subject Index

For the Subject Index, some subject headings have been changed from those of the previous Indices to accommodate the subject matter of recent papers published in Solar Physics. Subject headings are not included where no paper is listed for Volumes 126–131.

## Acknowledgements

I would like to express my appreciation to the National Optical Astronomy Observatories for the use of the computer facilities in compiling these subject and author indices.

KAREN L. HARVEY

**Abundances**

Metallicity, Opacity Coefficients and the Solar Standard Model

D. Courtaud, G. Damamme, E. Genot, M. Vuillemin, and S. Turck-Chièze **128**, 49

Space-Based Measurements of Elemental Abundances and Their Relation to Solar Abundances

M. A. Coplan, K. W. Ogilvie, P. Bochslers, and J. Geiss **128**, 195

The Abundance of  $^3\text{He}$  in the Solar Wind - a Constraint for Models of Solar Evolution

P. Bochslers, J. Geiss, and A. Maeder **128**, 203

**Active Longitudes** (*see Active Regions, Complexes, Nests, Zones of Activity*)

**Active Regions**

The Source Regions of Solar Coronal Mass Ejections

Richard A. Harrison **126**, 185

Asymmetric Flux Loops in Active Regions: I

L. van Driel-Gesztelyi and K. Petrovay **126**, 285

The Magnetic Fields of Active Regions: II. Rotation

Robert F. Howard **126**, 299

Sunspots: Their Rotation, Their Expansion in the Activity Zone, Their Links with the Giant Convective Cells

Maurizio Terno **127**, 29

Facular Structures Derived from Precise Two-Color Contrast Observations

Jun Nishikawa and Tadashi Hirayama **127**, 211

An Inverse Method for  $p$ -Mode Scattering Measurements

Timothy M. Brown **128**, 133

$p$ -Mode Absorption in the Giant Active Region of 10 March, 1989

D. C. Braun and T. L. Duvall, Jr. **129**, 83

Periodicities of Solar Irradiance and Solar Activity Indices. I

Judit Pap, W. Kent Tobiska, and S. David Bouwer **129**, 165

Sunspot Nests as Traced by a Cluster Analysis

M. P. Brouwer and C. Zwaan **129**, 221

Thirteen-Day Periodicity and the Center-to-Limb Dependence of UV, EUV, and X-Ray Emission of Solar Activity

R. F. Donnelly and L. C. Puga **130**, 369

Cluster Analysis of the Space-Time Distribution of Sunspot Groups during Solar Cycle No. 20

Kristóf Petrovay and Bashir K. Abuzeid **131**, 231

The Magnetic Fields of Active Regions. IV: Meridional Motions

Robert F. Howard **131**, 259

**Active Regions, Complexes, Nests, Zones of Activity**

Sunspot Nests as Traced by a Cluster Analysis

M. P. Brouwer and C. Zwaan **129**, 221

Cluster Analysis of the Space-Time Distribution of Sunspot Groups during Solar Cycle No. 20

Kristóf Petrovay and Bashir K. Abuzeid **131**, 231

**Active Regions, Evolution**

Magnetic Flux Transport of Decaying Active Regions and Enhanced Magnetic Network

Haimin Wang, Harold Zirin, and Guoxiang Ai **131**, 53

The Evolution and Orientation of Early Cycle 22 Active Regions

Annè T. Cannon and William H. Marquette **131**, 69

The Magnetic Fields of Active Regions. III: Growth and Decay of Magnetic Flux

Robert F. Howard **131**, 239

**Active Regions, Magnetic Field**

Asymmetric Flux Loops in Active Regions: I

L. van Driel-Gesztelyi and K. Petrovay **126**, 285

Asymmetric Flux Loops in Active Regions, II

K. Petrovay, J. C. Brown, L. van Driel-Gesztelyi, L. Fletcher, M. Marik, and G. Stewart **127**, 51

Magnetic Flux Transport of Decaying Active Regions and Enhanced Magnetic Network

Haimin Wang, Harold Zirin, and Guoxiang Ai **131**, 53



### The Evolution and Orientation of Early Cycle 22 Active Regions

Anne T. Cannon and William H. Marquette **131**, 69

### The Magnetic Fields of Active Regions. III: Growth and Decay of Magnetic Flux

Robert F. Howard **131**, 239

### Active Regions, Models

Transformation of Vector Magnetograms and the Problems Associated with the Effects of Perspective and the Azimuthal Ambiguity

G. Allen Gary and M. J. Hagyard **126**, 21

Asymmetric Flux Loops in Active Regions, II

K. Petrovay, J. C. Brown, L. van Driel-Gesztelyi, L. Fletcher, M. Marik, and G. Stewart **127**, 51

### Active Regions, Stellar (*see Stellar Physics*)

### Active Regions, Velocity Field

C IV Plasma Flow near Active Region Filaments

R. Grant Athay **126**, 135

Properties of the Large- and Small-Scale Flow Patterns in and around AR 19824

C. J. Schrijver and S. F. Martin **129**, 95

Mass Motions Associated with H $\alpha$  Active Region Arch Structures

A. A. Georgakilas, C. E. Alissandrakis, and Th. G. Zachariadis **129**, 277

Magnetic Flux Transport of Decaying Active Regions and Enhanced Magnetic Network

Haimin Wang, Harold Zirin, and Guoxiang Ai **131**, 53

The Magnetic Fields of Active Regions. IV: Meridional Motions

Robert F. Howard **131**, 259

### Atmospheres, Stellar (*see Stellar Physics*)

### Atmospheric Models, Solar

Investigation on Numerical Accuracy of ZAMS Models of One Solar Mass

P. Morel, J. Provost, and G. Berthomieu **128**, 7

Metallicity, Opacity Coefficients and the Solar Standard Model

D. Courtaud, G. Damamme, E. Genot, M. Vuillemin, and S. Turck-Chièze **128**, 49

### Atomic Parameters

Theoretical Emission Line Strengths for Ne VII Compared to EUV Solar Observations

F. P. Keenan **131**, 291

### Aurora (*see Magnetosphere*)

### Book Reviews

M. Stix, *The Sun, An Introduction*, Astronomy and Astrophysics Library, Springer-Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, 1989.

R. Mewe **126**, 411

U. Esser, H. Hefele, I. Heinrich, W. Hofmann, D. Krahn, V. R. Matas, L. D. Schmadel, and G. Zech (eds.), *Astronomy and Astrophysics Abstracts*, Vol. 47 / 48, Springer-Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, 1989.

Z. Švestka **126**, 411

H. V. Klapdor (ed.), *Neutrinos*, Springer-Verlag, Berlin, 1988.

J. N. Bahcall **127**, 209

L. Lam and H. C. Morris (eds.), *Wave Phenomena: Theoretical, Computational, and Practical Aspects*, Springer-Verlag, New York.

R. Rosner **127**, 209

D. M. Alloin and J. M. Mariotti, *Diffraction-Limited Imaging with Very Large Telescopes*, Proceedings of the NATO Advanced Study Institute on Diffraction-Limited Imaging with Very Large Telescopes, Cargèse, Corsica, 13-23 September, 1988, Kluwer Academic Publishers, Dordrecht, Holland, 1989.

J. Rayrole **128**, 427

D. B. Melrose, *Instabilities in Space and Laboratory Plasmas*, Cambridge University Press, Cambridge, 1989.

A. O. Benz **128**, 427

P. D. B. Collins, A. D. Martin, and E. J. Squires, *Particle Physics and Cosmology*, John Wiley, New York-Chichester-Brisbane-Toronto-Singapore, 1989.

J. Kleczek 129, 199

J. O. Stenflo (ed.), *Solar Photosphere: Structure, Convection, and Magnetic Fields*, IAU Symposium No. 138, Kluwer Academic Publishers, Dordrecht / Boston / London, 1990.

W. Mattig 129, 199

P. E. Sandholt and A. Egeland (eds.), *Electromagnetic Coupling in the Polar Clefts and Caps*, NATO ASI Series C: Mathematical and Physical Sciences Series, Vol. 278, Kluwer Academic Publishers, Dordrecht, 1989.

K. Schindler 131, 415

### **Center-Limb Observations**

Asymmetries in Limb Darkening Reanalyzed

G. H. Elste 126, 37

The Role of Telescopic Stray Light in Limb-Darkening Scans Obtained in April 1981 (and Later)

Heinz Neckel and Dietrich Labs 126, 47

### **Center-Limb Observations, Brightness**

Asymmetries in Limb Darkening Reanalyzed

G. H. Elste 126, 37

Facular Structures Derived from Precise Two-Color Contrast Observations

Jun Nishikawa and Tadashi Hirayama 127, 211

### **Center-Limb Observations, Line Profiles**

An Explanation of the 'Granulation Boundary' in the HR Diagram

Cornelis de Jager 126, 201

### **Chromosphere, Active (see Active Regions)**

### **Chromosphere, Heating (see Heating, Atmospheric)**

### **Chromosphere, Stellar (see Stellar Physics)**

### **Chromosphere, Structures**

Mass Motions Associated with H $\alpha$  Active Region Arch Structures

A. A. Georgakilas, C. E. Alissandrakis, and Th. G. Zachariadis 129, 277

### **Convection Zone**

Mixing-Length Theory and the Excitation of Solar Acoustic Oscillations

N. J. Balmforth and D. O. Gough 128, 161

Azimuthal Convective Rolls and the Subsurface Magnetic Field

William J. Merryfield 128, 305

A Map of the Horizontal Flows in the Solar Convection Zone

Frank Hill 128, 321

### **Corona**

Large-Scale Distribution of Magnetic Fields, Green Corona and Prominences during an Extended Activity Cycle

Václav Bumba, Vojtech Rušin, and Milan Rybanský 128, 253

Periodicities in the Green Corona for the Sun as a Star

Vojtech Rušin and Juraj Zverko 128, 261

Whistlers in the Solar Corona and Their Relevance to Fine Structures of Type IV Radio Emission

G. P. Chernov 130, 75

Viscous Damping of Surface Magnetohydrodynamic Waves on Magnetic Interface in Cold Plasmas

M. S. Ruderman 131, 11

### **Corona, Active**

Thermal Equilibria of Coronal Magnetic Arcades

C. D. C. Steele and E. R. Priest 127, 65

Steady Heat Conduction in Coronal Loop Unstable against Plasma Instability

T. Takakura 127, 95

Formation and Cooling of the Giant HXIS Arches of November 6-7, 1980

R. A. Kopp and G. Poletto 127, 267

Magnetostatic Equilibria for Coronal Loops on Rotating Stars

M. Jardine and A. Collier Cameron 131, 269



**Corona, *F* (see *Corona*)****Corona, *K***

The Structure of the White-Light Corona and the Large-Scale Magnetic Field

D. G. Sime and M. K. McCabe 126, 267

**Corona, Magnetic Fields (see *Magnetic Fields, Corona*)****Corona, Models**

Thermal Equilibria of Coronal Magnetic Arcades

C. D. C. Steele and E. R. Priest 127, 65

Non-Isothermal Atmosphere, Solar Wind, Shearing and Pressing Magnetic Field and Preflare Loops

Su Qing-Rui 127, 139

Forbidden Line Ratios from Si VIII and S x Coronal Ions

B. N. Dwivedi 131, 49

Magnetostatic Equilibria for Coronal Loops on Rotating Stars

M. Jardine and A. Collier Cameron 131, 269

Magnetic Reconnection and Energy Release in the Solar Corona by Taylor Relaxation

G. E. Vekstein, E. R. Priest, and C. D. C. Steele 131, 297

**Corona, Quiet (see *Corona*)****Corona, Radio Emission (see *Corona*)****Corona, Stellar (see *Stellar Physics*)****Corona, Structures**

The Structure of the White-Light Corona and the Large-Scale Magnetic Field

D. G. Sime and M. K. McCabe 126, 267

Thermal Equilibria of Coronal Magnetic Arcades

C. D. C. Steele and E. R. Priest 127, 65

Steady Heat Conduction in Coronal Loop Unstable against Plasma Instability

T. Takakura 127, 95

Non-Isothermal Atmosphere, Solar Wind, Shearing and Pressing Magnetic Field and Preflare Loops

Su Qing-Rui 127, 139

Real-Time Simulation of a Potential Magnetic Field in a Post-Flare Arch

Giannina Poletto and Zdeněk Švestka 129, 363

**Corona, Temperature**

Thermal Equilibria of Coronal Magnetic Arcades

C. D. C. Steele and E. R. Priest 127, 65

Fabry-Pérot Line Profiles in the  $\lambda 5303 \text{ \AA}$  and  $\lambda 6373 \text{ \AA}$  Coronal Lines Obtained during the 1983

Indonesian Eclipse

T. Chandrasekhar, J. N. Desai, N. M. Ashok, and Jay M. Pasachoff 131, 25

**Corona, Velocity Fields (see *Velocity Fields*)****Coronal Arches (see *Corona, Structures*)****Coronal Heating (see *Heating, Atmospheric*)****Coronal Holes**

The Source Regions of Solar Coronal Mass Ejections

Richard A. Harrison 126, 185

The Intense Solar Activity of March 1989 as a Precursor for the Occurrence of an ENSO by the End of 1989

B. Mendoza, R. Pérez Enríquez, and M. Alvarez-Madrigal 126, 195

Forbidden Line Ratios from Si VIII and S x Coronal Ions

B. N. Dwivedi 131, 49

The Evolution and Orientation of Early Cycle 22 Active Regions

Anne T. Cannon and William H. Marquette 131, 69

Magnetic Field Configurations Associated with Fast Solar Wind

N. R. Sheeley, Jr. and Y.-M. Wang 131, 165

Numerical Simulations of High-Speed Solar Wind Streams within 1 AU and Their Signatures at 1 AU

Z. Smith and M. Dryer 131, 363



**Coronal Loops** (*see Corona, Active*)**Coronal Mass Ejections**

The Source Regions of Solar Coronal Mass Ejections

Richard A. Harrison 126, 185

**Coronal Streamers**

Non-Isothermal Atmosphere, Solar Wind, Shearing and Pressing Magnetic Field and Preflare Loops

Su Qing-Rui 127, 139

**Coronal Transients** (*see Coronal Mass Ejections*)**Cosmic Rays, Galactic**

On the High-Speed Plasma Streams, Stormtime Sudden Commencements and Cosmic-Ray Intensity: Relation amongst Them during Epoch 1978 to 1982

D. Venkatesan and B. Y. Zhu 131, 385

**Current Sheets** (*see Electric Currents and Current Sheets*)**Eclipses**

Fabry-Pérot Line Profiles in the  $\lambda 5303 \text{ \AA}$  and  $\lambda 6373 \text{ \AA}$  Coronal Lines Obtained during the 1983

Indonesian Eclipse

T. Chandrasekhar, J. N. Desai, N. M. Ashok, and Jay M. Pasachoff 131, 25

**Electric Currents and Current Sheets**

Impulsive Phase Heating by Uni-Directional Current Systems in Solar Flares

T. N. La Rosa 126, 153

Magnetic Field Evolution during Prominence Eruptions and Two-Ribbon Flares

E. R. Priest and T. G. Forbes 126, 319

Application of the Sine-Poisson Equation in Solar Magnetostatics

G. M. Webb and G. P. Zank 127, 229

The Flare as a Result of Cross-Interaction of Loops: Causal Relationship with a Prominence

A. M. Uralov 127, 253

Return Current and Collisional Effects in Nonthermal Electron Beams with Pulsed Injection

M. Karlický, D. Alexander, J. C. Brown, and A. L. MacKinnon 129, 325

Particle Beams in the Solar Atmosphere: General Overview

D. B. Melrose 130, 3

Discrete Alfvén Waves in Solar Loop Prominences

Carlos A. de Azevedo, Altair S. de Assis, Hisataki Shigueoka, and Paulo H. Sakanaka 131, 119

**Emission, Particle** (*see Energetic Particles*)**Energetic Particles**

Proceedings of the CESRA Workshop on 'Particle Beams in the Solar Atmosphere' held at Braunwald (Switzerland), August 21-25, 1989, *Table of Contents*

130, v

Proceedings of the CESRA Workshop on 'Particle Beams in the Solar Atmosphere' held at Braunwald (Switzerland), August 21-25, 1989, *Preface*

A. O. Benz and A. Magun 130, 1

Interplanetary Particle Beams

G. A. Dulk 130, 139

**Energetic Particles, Abundances** (*see Energetic Particles; Abundances*)**Energetic Particles, Acceleration**

Simulation Studies of Electron Acceleration by Ion Ring Distributions in Solar Flares

K. G. McClements, J. J. Su, R. Bingham, J. M. Dawson, and D. S. Spicer 130, 229

On the Production of Hard X-Rays in Solar Flares

G. M. Simnett and M. G. Haines 130, 253

**Energetic Particles, Electrons**

Return Current and Collisional Effects in Nonthermal Electron Beams with Pulsed Injection

M. Karlický, D. Alexander, J. C. Brown, and A. L. MacKinnon 129, 325

Particle Beams in the Solar Atmosphere: General Overview

D. B. Melrose **130**, 3

Interplanetary Particle Beams

G. A. Dulk **130**, 139

Electron Beam Formation and Stability

L. Muschietti **130**, 201

Simulation Studies of Electron Acceleration by Ion Ring Distributions in Solar Flares

K. G. McClements, J. J. Su, R. Bingham, J. M. Dawson, and D. S. Spicer **130**, 229

Effect of Electron Beams during Solar Flares

J. Aboudarham, J. C. Henoux, J. C. Brown, G. H. J. van den Oord, L. van Driel-Gesztelyi, and O. Gerlei **130**, 243

On the Production of Hard X-Rays in Solar Flares

G. M. Simnett and M. G. Haines **130**, 253

Pulse Beam Heating of the Solar Atmosphere

Marian Karlický **130**, 347

Nonthermal Electrons in the Thick-Target Reverse-Current Model for Hard X-Ray Bremsstrahlung

Yu. E. Litvinenko and B. V. Somov **131**, 319

Electron Beams and Associated Rapid Fluctuations in Solar Flares

C. S. Li, Q. J. Fu, and H. W. Li **131**, 337

**Energetic Particles, Helium Nuclei** (*see Energetic Particles*)

**Energetic Particles, Neutrons** (*see Energetic Particles*)

**Energetic Particles, Propagation**

Particle Beams in the Solar Atmosphere: General Overview

D. B. Melrose **130**, 3

Observations of Beam Propagation

M. Pick and G. H. J. van den Oord **130**, 83

Electron Beam Formation and Stability

L. Muschietti **130**, 201

**Energetic Particles, Protons**

Solar Proton Events during Solar Cycles 19, 20, 21

J. Feynman, T. P. Armstrong, L. Dao-Gibner, and S. Silverman **126**, 385

A Summary of Major Solar Proton Events

M. A. Shea and D. F. Smart **127**, 297

Evidence of Individual Solar Proton Events in Antarctic Snow

Gisela A. M. Deschhoff and Edward J. Zeller **127**, 333

Periodicities in the Occurrence Rate of Solar Proton Events

S. Gabriel, R. Evans, and J. Feynman **128**, 415

A Mechanism for Producing Plasma Radiation in the GigaHertz Range by Precipitating High-Energy Protons

D. F. Smith and A. O. Benz **131**, 351

**Faculae, Photospheric** (*see Photosphere, Network*)

**Filaments** (*see Prominences*)

**Filigree** (*see Intergranular Region and Subgranular Structures*)

**Flare Stars** (*see Flares, Stellar*)

**Flares**

The Intense Solar Activity of March 1989 as a Precursor for the Occurrence of an ENSO by the End of 1989

B. Mendoza, R. Pérez Enríquez, and M. Alvarez-Madrigal **126**, 195

Magnetic Field Evolution during Prominence Eruptions and Two-Ribbon Flares

E. R. Priest and T. G. Forbes **126**, 319

Some Comments on the East-West Solar Flare Distribution during the 1976-1985 Period

A. M. Heras, B. Sanahuja, M. A. Shea, and D. F. Smart **126**, 371

Solar Proton Events during Solar Cycles 19, 20, 21

J. Feynman, T. P. Armstrong, L. Dao-Gibner, and S. Silverman **126**, 385

- Evidence for Solar-Cycle Evolution of North-South Flare Asymmetry during Cycles 20 and 21  
Howard A. Garcia **127**, 185
- p*-Mode Absorption in the Giant Active Region of 10 March, 1989  
D. C. Braun and T. L. Duvall, Jr. **129**, 83
- On a New Class of Impulsive Flares with No Nuclear  $\gamma$ -Ray Line Emission (*Letter*)  
F.-W. Bech, J. Steinacker, and R. Schlickeiser **129**, 195
- Flare Fragmentation and Type III Productivity in the 1980 June 27 Flare  
M. J. Aschwanden, A. O. Benz, R. A. Schwartz, R. P. Lin, R. M. Pelling, and W. Stehling **130**, 39
- Effect of Electron Beams during Solar Flares  
J. Aboudarham, J. C. Henoux, J. C. Brown, G. H. J. van den Oord, L. van Driel-Gesztelyi, and O. Gerlei **130**, 243
- H $\alpha$  Line Profile Observations of a Limb Flare with High Temporal Resolution  
M. Graeter **130**, 337
- Stereoscopic Measurements of Flares from PHOBOS and GOES  
Howard A. Garcia and František Fárník **131**, 137
- BEARALERTS: A Successful Flare Prediction System  
Harold Zirin and William Marquette **131**, 149
- Flares, Ejecta** (*see Surges; Prominences; Prominences, Eruptive; Flares*)
- Flares, Energetic Particles**
- Solar Proton Events during Solar Cycles 19, 20, 21  
J. Feynman, T. P. Armstrong, L. Dao-Gibner, and S. Silverman **126**, 385
- A Summary of Major Solar Proton Events  
M. A. Shea and D. F. Smart **127**, 297
- Evidence of Individual Solar Proton Events in Antarctic Snow  
Gisela A. M. Deschhoff and Edward J. Zeller **127**, 333
- Periodicities in the Occurrence Rate of Solar Proton Events  
S. Gabriel, R. Evans, and J. Feynman **128**, 415
- Anomalous Short-Period Pulsations in GOES Magnetometer Data before Solar Proton Events  
D. Y. Cheng **131**, 395
- Flares, Flash Phase** (*see Flares*)
- Flares, Loop**
- Investigation of Non-Uniform Heating during the Decay Phase of Solar Flares  
B. Sylwester, J. Sylwester, R. D. Bentley, and A. Fludra **126**, 177
- Discrete Alfvén Waves in Solar Loop Prominences  
Carlos A. de Azevedo, Altair S. de Assis, Hisataki Shigueoka, and Paulo H. Sakanaka **131**, 119
- Nonthermal Electrons in the Thick-Target Reverse-Current Model for Hard X-Ray Bremsstrahlung  
Yu. E. Litvinenko and B. V. Somov **131**, 319
- Flares, Models**
- Impulsive Phase Heating by Uni-Directional Current Systems in Solar Flares  
T. N. La Rosa **126**, 153
- Investigation of Non-Uniform Heating during the Decay Phase of Solar Flares  
B. Sylwester, J. Sylwester, R. D. Bentley, and A. Fludra **126**, 177
- Plasma Motions in the Flare of 1982 June 6 (X12)  
Tetsuya Watanabe **126**, 351
- Steady Heat Conduction in Coronal Loop Unstable against Plasma Instability  
T. Takakura **127**, 95
- The Flare as a Result of Cross-Interaction of Loops: Causal Relationship with a Prominence  
A. M. Uralov **127**, 253
- Loss of Magnetic Tension in Pre-Flare Magnetic Configurations  
P. Venkatakrishnan **128**, 371
- Flares, Pre-Flare Phenomena** (*see Flares*)
- Flares, Proton** (*see Flares, Energetic Particles; Energetic Particles, Protons*)



**Flares, Relation to Active Region Magnetic Field**

Formation and Cooling of the Giant HXIS Arches of November 6-7, 1980

R. A. Kopp and G. Poletto **127**, 267

Loss of Magnetic Tension in Pre-Flare Magnetic Configurations

P. Venkatakrishnan **128**, 371

The Role of the Magnetic Field in Intensity and Geometry in the Type III Burst Generation

P. Zlobec, V. Ruždjak, B. Vršnak, M. Karlický, and M. Messerotti **130**, 31

**Flares, Spectrum**

Plasma Motions in the Flare of 1982 June 6 (X12)

Tetsuya Watanabe **126**, 351

On a New Class of Impulsive Flares with No Nuclear  $\gamma$ -Ray Line Emission (*Letter*)

F.-W. Bech, J. Steinacker, and R. Schlickeiser **129**, 195

**Flares, Stellar**

Radio Emission from Flares Stars

T. S. Bastian **130**, 265

Meter-Decameter Observations of dMe Flare Stars with the Clark Lake Radio Telescope

P. D. Jackson, M. R. Kundu, and N. Kassim **130**, 391

**Flares, Waves (see *Flares; Waves, Modes*)****Flares, White-Light (see *Flares*)****Frontispieces**

Eruptive prominence observed on 26 October, 1989 at Norikura Solar Observatory, Japan

E. Hiei **126**, No. 1, iv

Solar telescope at rest. McMath telescope of the National Solar Observatory

W. C. Livingston **126**, No. 2, iv

Spectacular prominence eruption. This H $\alpha$  image was obtained with the 10-cm dual coronagraphs at Mees Solar Observatory of the Institute for Astronomy, Haleakala, Maui. Time of Observation: October 5, 1989, 17:55:01 UT

R. C. Canfield **127**, No. 1, iv

A complex of active regions under high resolution in H $\alpha$ , 18 June 1981

H. Zirin **127**, No. 2, iv

A large delta spot in the wing of H $\alpha$ , 25 July 1981

H. Zirin **128**, No. 1, iv

Post-Flare loops observed with a 20-cm lens coronagraph. Loops were centered at P.A. = 105°

Astronomical Institute, Tatranská Lomnica, Czechoslovakia **128**, No. 2, iv

Chalk drawing of prominences by C. F. Fearnley, August 15, 1873.

E. Jensen **129**, No. 1, iv

Photoheliogram at 546 nm from 1990 August 24, 06:53:20 UT.

Th. Pettauer **129**, No. 2, iv

An eruptive flare loop, 11 August, 1981

H. Zirin **130**, iv

Filament eruption on 25 July, 1988

H. Zirin **131**, No. 1, iv

Erupting prominence and associated flare observed at Big Bear Solar Observatory on 26 June, 1982, 00:49:07 UT

H. Zirin **131**, No. 2, iv

**Geomagnetic Storms (see *Magnetosphere, Geomagnetic Disturbances*)****Granulation**

The Large-Scale Pattern Formed by the Spatial Distribution of Granules

R. Muller, Th. Roudier, and J. Vigneau **126**, 53

Continuous and Line Spectra of Granules and Intergranular Lanes

Z. Suemoto, E. Hiei, and Y. Nakagomi **127**, 11

**Granulation, Models (see *Granulation*)**



**Heating, Atmospheric**

The Detection of Wave Activity in the Solar Corona Using UV Line Spectra

K. G. McClements, R. A. Harrison, and D. Alexander **131**, 41

Magnetic Reconnection and Energy Release in the Solar Corona by Taylor Relaxation

G. E. Vekstein, E. R. Priest, and C. D. C. Steele **131**, 297

**Heating, in Flares**

Impulsive Phase Heating by Uni-Directional Current Systems in Solar Flares

T. N. La Rosa **126**, 153

On the Production of Hard X-Rays in Solar Flares

G. M. Simnett and M. G. Haines **130**, 253

Pulse Beam Heating of the Solar Atmosphere

Marian Karlický **130**, 347

**Instabilities**

Steady Heat Conduction in Coronal Loop Unstable against Plasma Instability

T. Takakura **127**, 95

Thermal Instability in Slab Geometry in the Presence of Anisotropic Thermal Conduction

R. A. M. van der Linden and M. Goossens **131**, 79

**Instrumental Effects**

The Role of Telescopic Stray Light in Limb-Darkening Scans Obtained in April 1981 (and Later)

Heinz Neckel and Dietrich Labs **126**, 47

**Instrumentation**

Observations of Low-Degree Solar Oscillations with Few Detector Elements

T. Appourchaux and B. N. Andersen **128**, 91

Zeeman-Doppler Imaging: a New Option for Magnetic Field Study of Ap and Solar-Type Stars

J.-F. Donati and M. Semel **128**, 227

On the Interpretation of the 2.84 GHz Solar UFFS Data of May 16, 1981

Zheng Le-Ping and Liu Yu-Ying **129**, 127

**Intergranular Region and Subgranular Structures**

Continuous and Line Spectra of Granules and Intergranular Lanes

Z. Suemoto, E. Hiei, and Y. Nakagomi **127**, 11

**Integrated Light Observations (see *Solar Irradiance*)****Interior, Solar**

IAU Colloquium 121 'Inside the Sun' held at Versailles, May 22-26, 1989, *Table of Contents*

**128**, v

IAU Colloquium 121 'Inside the Sun' held at Versailles, May 22-26, 1989, *Preface*

Michel Cribier **128**, 1

How Is the Sun Working?

Attila Grandpierre **128**, 3

Investigation on Numerical Accuracy of ZAMS Models of One Solar Mass

P. Morel, J. Provost, and G. Berthomieu **128**, 7

WIMPS and Solar Evolution Code

Yannick Giraud-Héraud, Jean Kaplan, François Martin de Volnay, Charling Tao, and Sylvaine Turck-Chièze **128**, 21

The Equation of State of the Solar Interior: a Comparison of Results from Two Competing Formalisms

Werner Däppen, Yveline Lebreton, and Forrest Rogers **128**, 35

Metallicity, Opacity Coefficients and the Solar Standard Model

D. Courtaud, G. Damamme, E. Genot, M. Vuillemin, and S. Turck-Chièze **128**, 49

An Attempt to Identify Low  $l$  - Low  $n$  Solar Acoustic Modes

M. Anguera Gubau, P. L. Pallé, F. Pérez Hernández, and T. Roca Cortés **128**, 79

Non-Equidistant Spectrum of Gravity Modes of a Solar Model with a Mixed Core

J. Provost, G. Berthomieu, E. Gavryuseva, and V. Gavryusev **128**, 111

Periods and Stability of Solar  $g$ -Modes

Arthur N. Cox **128**, 123

## Sensitivity of Solar Eigenfrequencies to the Age of the Sun

D. O. Gough and E. Novotny **128**, 143

## Mixing-Length Theory and the Excitation of Solar Acoustic Oscillations

N. J. Balmforth and D. O. Gough **128**, 161The Abundance of  $^3\text{He}$  in the Solar Wind - a Constraint for Models of Solar EvolutionP. Bochsler, J. Geiss, and A. Maeder **128**, 203

## Azimuthal Convective Rolls and the Subsurface Magnetic Field

William J. Merryfield **128**, 305**Interior, Magnetic Field Theory** (*see Interior*)**Interior, Stellar** (*see Stellar Physics*)**Interplanetary Medium** (*see Solar Wind*)**Interplanetary Sector Structure** (*see Magnetic Fields, Interplanetary Sector Structure*)**Ionosphere**

## The 1989 Solar Terrestrial Predictions Workshop

Richard Thompson **127**, 207**Macrospicules** (*see Spicules*)**Magnetic Fields**

## Transformation of Vector Magnetograms and the Problems Associated with the Effects of Perspective and the Azimuthal Ambiguity

G. Allen Gary and M. J. Hagyard **126**, 21

## The Reversal of the Solar Polar Magnetic Fields. I: The Surface Transport of Magnetic Flux

P. R. Wilson, P. S. McIntosh, and H. B. Snodgrass **127**, 1

## Magnetic Flux Transport of Decaying Active Regions and Enhanced Magnetic Network

Haimin Wang, Harold Zirin, and Guoxiang Ai **131**, 53**Magnetic Fields, Corona**

## The Structure of the White-Light Corona and the Large-Scale Magnetic Field

D. G. Sime and M. K. McCabe **126**, 267

## Real-Time Simulation of a Potential Magnetic Field in a Post-Flare Arch

Giannina Poletto and Zdeněk Švestka **129**, 363The Evolution of Coronal Magnetic Fields (*Letter*)E. R. Priest and T. G. Forbes **130**, 399

## Magnetic Field Configurations Associated with Fast Solar Wind

N. R. Sheeley, Jr. and Y.-M. Wang **131**, 165**Magnetic Fields, Current Free** (*see Magnetic Fields, Models*)**Magnetic Fields, Dissipation** (*see Magnetic Fields*)**Magnetic Fields, Force Free** (*see Magnetic Fields, Models*)**Magnetic Fields, Interior** (*see Interior*)**Magnetic Fields, Models**

## Asymmetries in Limb Darkening Reanalyzed

G. H. Elste **126**, 37

## Asymmetric Flux Loops in Active Regions, II

K. Petrovay, J. C. Brown, L. van Driel-Gesztelyi, L. Fletcher, M. Marik, and G. Stewart **127**, 51

## Non-Isothermal Atmosphere, Solar Wind, Shearing and Pressing Magnetic Field and Preflare Loops

Su Qing-Rui **127**, 139

## Application of the Sine-Poisson Equation in Solar Magnetostatics

G. M. Webb and G. P. Zank **127**, 229The Evolution of Coronal Magnetic Fields (*Letter*)E. R. Priest and T. G. Forbes **130**, 399

**Magnetic Field Configurations Associated with Fast Solar Wind**N. R. Sheeley, Jr. and Y.-M. Wang **131**, 165**Magnetostatic Equilibria for Coronal Loops on Rotating Stars**M. Jardine and A. Collier Cameron **131**, 269**Magnetic Reconnection and Energy Release in the Solar Corona by Taylor Relaxation**G. E. Vekstein, E. R. Priest, and C. D. C. Steele **131**, 297**Magnetic Fields, Network** (*see Magnetic Fields*)**Magnetic Fields, Photosphere****The Structure of the White-Light Corona and the Large-Scale Magnetic Field**D. G. Sime and M. K. McCabe **126**, 267**Velocity Pattern of Small Scale Magnetic Fields** (*Letter*)H. C. Dara, C. E. Alissandrakis, and S. Koutchmy **126**, 403 *Erratum 128*, 431**The Reversal of the Solar Polar Magnetic Fields. I: The Surface Transport of Magnetic Flux**P. R. Wilson, P. S. McIntosh, and H. B. Snodgrass **127**, 1**Large-Scale Distribution of Magnetic Fields, Green Corona and Prominences during an Extended Activity Cycle**Václav Bumba, Vojtech Rušin, and Milan Rybanský **128**, 253**Solar Surface Velocity Fields Determined from Small Magnetic Features**R. F. Howard, J. W. Harvey, and S. Forgach **130**, 295**Magnetic Fields, Polar** (*see Magnetic Fields*)**Magnetic Fields, Solar Wind** (*see Magnetic Fields, Interplanetary*)**Magnetic Fields, Stellar** (*see Stellar Physics*)**Magnetic Fields, Transport** (*see Magnetic Fields*)**Magneto-Optical Effects** (*see Spectral Line, Formation In Magnetic Field*)**Magnetohydrodynamics****Magnetic Field Evolution during Prominence Eruptions and Two-Ribbon Flares**E. R. Priest and T. G. Forbes **126**, 319**Application of the Sine-Poisson Equation in Solar Magnetostatics**G. M. Webb and G. P. Zank **127**, 229**Magneto-Atmospheric Waves**Toufik E. Abdelatif **129**, 201**Thermal Instability in Slab Geometry in the Presence of Anisotropic Thermal Conduction**R. A. M. van der Linden and M. Goossens **131**, 79**Magnetic Reconnection and Energy Release in the Solar Corona by Taylor Relaxation**G. E. Vekstein, E. R. Priest, and C. D. C. Steele **131**, 297**Magnetosphere****A Two-Component Solar Cycle**J. P. Legrand and P. A. Simon **131**, 187**Anomalous Short-Period Pulsations in GOES Magnetometer Data before Solar Proton Events**D. Y. Cheng **131**, 395**Aurorae Borealis Lag during the Maunder Minimum** (*Letter*)Ludwig Schlamming **131**, 411**Magnetosphere, Geomagnetic Disturbances****The 1989 Solar Terrestrial Predictions Workshop**Richard Thompson **127**, 207**A Two-Component Solar Cycle**J. P. Legrand and P. A. Simon **131**, 187**Numerical Simulations of High-Speed Solar Wind Streams within 1 AU and Their Signatures at 1 AU**Z. Smith and M. Dryer **131**, 363**On the High-Speed Plasma Streams, Stormtime Sudden Commencements and Cosmic-Ray Intensity: Relation amongst Them during Epoch 1978 to 1982**D. Venkatesan and B. Y. Zhu **131**, 385**Anomalous Short-Period Pulsations in GOES Magnetometer Data before Solar Proton Events**D. Y. Cheng **131**, 395

**Magnetosphere, Models** (*see Magnetosphere*)**Mesogranulation** (*see Granulation*)**Molecules, Abundances** (*see Abundances*)**Neutrinos**

On the Fourier Spectrum Analysis of the Solar Neutrino Capture Rate

H. J. Haubold and E. Gerth 127, 347

How Is the Sun Working?

Attila Grandpierre 128, 3

WIMPS and Solar Evolution Code

Yannick Giraud-Héraud, Jean Kaplan, François Martin de Volnay, Charling Tao, and  
Sylvaine Turck-Chièze 128, 21

Metallicity, Opacity Coefficients and the Solar Standard Model

D. Courtaud, G. Damamme, E. Genot, M. Vuillemin, and S. Turck-Chièze 128, 49

Borex: Solar Neutrino Experiment via Weak Neutral and Charged Currents in Boron-11

T. Kovacs, J. Mitchell, P. Raghavan, R. S. Raghavan, S. J. Freedman, J. Kay, C. E. Lane, R. I. Steinberg,  
C. Cattadori, A. Donati, S. Pakvasa, M. Deutsch, P. Rothschild, C. Arpesella, G. Bellini, S. Bonetti,  
M. Campanella, P. Inzani, I. Manno, E. Meroni, G. Ranucci, F. Ragusa, G. Cecchet, A. de Bari,  
M. Gallorini, and A. Perotti 128, 61

Neutrino Astrophysical Potentialities of a Large-Mass Modular Detector Based on Large Activated Inorganic  
Single Crystals

V. N. Gavrin, A. M. Pshukov, and G. T. Zatsepin 128, 67

Periods and Stability of Solar *g*-Modes

Arthur N. Cox 128, 123

Can Variations of Sunspot Number Be Related to Those of the Solar Neutrino Flux? (*Letter*)

Y. V. Vandakurov 131, 407

**Non-Thermal Radiation**

On a New Class of Impulsive Flares with No Nuclear  $\gamma$ -Ray Line Emission (*Letter*)

F.-W. Bech, J. Steinacker, and R. Schlickeiser 129, 195

**Nuclear Reactions** (*see Physical Processes*)**Oscillations**

Phase Differences between Luminosity and Velocity Measurements of the Acoustic Modes

A. Jiménez, M. Álvarez, N. B. Andersen, V. Domingo, A. Jones, P. L. Pallé, and T. Roca Cortés 126, 1

Helioseismic Imaging of Sunspots at Their Antipodes

Charles Lindsey and Douglas C. Braun 126, 101

Observations of Low-Degree Solar Oscillations with Few Detector Elements

T. Appourchaux and B. N. Andersen 128, 91

Non-Equidistant Spectrum of Gravity Modes of a Solar Model with a Mixed Core

J. Provost, G. Berthomieu, E. Gavryuseva, and V. Gavryusev 128, 111

Periods and Stability of Solar *g*-Modes

Arthur N. Cox 128, 123

An Inverse Method for *p*-Mode Scattering Measurements

Timothy M. Brown 128, 133

Sensitivity of Solar Eigenfrequencies to the Age of the Sun

D. O. Gough and E. Novotny 128, 143

Mixing-Length Theory and the Excitation of Solar Acoustic Oscillations

N. J. Balmforth and D. O. Gough 128, 161

A Map of the Horizontal Flows in the Solar Convection Zone

Frank Hill 128, 321

Resonant Oscillations in Sunspot Umbrae

W. P. Wood 128, 353

High-Resolution Analysis of Solar Photospheric Oscillations

Audouin Dollfus 129, 1

*p*-Mode Absorption in the Giant Active Region of 10 March, 1989

D. C. Braun and T. L. Duvall, Jr. 129, 83



**Magneto-Atmospheric Waves**Toufik E. Abdelatif **129**, 201**Oscillations, Intensity**

## Phase Differences between Luminosity and Velocity Measurements of the Acoustic Modes

A. Jiménez, M. Álvarez, N. B. Andersen, V. Domingo, A. Jones, P. L. Pallé, and T. Roca Cortés **126**, 1The Oscillatory Behaviour of Solar Faculae (*Letter*)H. Balthasar **127**, 289**Oscillations, Velocity**

## Phase Differences between Luminosity and Velocity Measurements of the Acoustic Modes

A. Jiménez, M. Álvarez, N. B. Andersen, V. Domingo, A. Jones, P. L. Pallé, and T. Roca Cortés **126**, 1

## Oscillatory Motions in an Active Prominence

B. Vršnak, V. Ruždjak, R. Brajša, and F. Zloch **127**, 119An Attempt to Identify Low  $l$  - Low  $n$  Solar Acoustic ModesM. Anguera Gubau, P. L. Pallé, F. Pérez Hernández, and T. Roca Cortés **128**, 79

## 160 Minute Solar Variations and the 22 Year Cycle

V. A. Kotov and T. T. Tsap **128**, 269

## High-Resolution Analysis of Solar Photospheric Oscillations

Audouin Dollfus **129**, 1**Photosphere, Magnetic Fields** (*see Magnetic Fields, Photosphere*)**Photosphere, Network**

## Facular Structures Derived from Precise Two-Color Contrast Observations

Jun Nishikawa and Tadashi Hirayama **127**, 211The Oscillatory Behaviour of Solar Faculae (*Letter*)H. Balthasar **127**, 289**Photosphere, Stellar** (*see Stellar Physics*)**Photosphere, Velocity Fields** (*see Velocity Fields, Photosphere*)**Plasma Instabilities** (*see Plasma Physics; Instabilities*)**Plasma Physics**

## Return Current and Collisional Effects in Nonthermal Electron Beams with Pulsed Injection

M. Karlický, D. Alexander, J. C. Brown, and A. L. MacKinnon **129**, 325

## Viscous Damping of Surface Magnetohydrodynamic Waves on Magnetic Interface in Cold Plasmas

M. S. Ruderman **131**, 11

## Nonthermal Electrons in the Thick-Target Reverse-Current Model for Hard X-Ray Bremsstrahlung

Yu. E. Litvinenko and B. V. Somov **131**, 319**Plasma, Particle Acceleration** (*see Plasma Physics*)**Polarization**

## Spectral Line and White-Light Intensities in the Corona in the Presence of Propagating or Standing Shocks

Ruth Esser and Shadia Rifai Habbal **129**, 153

## Velocities and Magnetic Fields Observed in a Sunspot

P. Arena, E. Landi Degl'Innocenti, and G. Noci **129**, 259**Polarization, Instrumental** (*see Instrumental Effects*)**Polarization, Line** (*see Polarization*)**Polarization, Radio**

## A Study of the Spectrum and the Polarization of the Noise Storm Continua between 234 and 40 MHz

A. Böhme **128**, 399

## Polarisation of Type III Bursts between 164 and 435 MHz: Structure and Variation with Frequency

C. Mercier **130**, 119**Prominences**

## Dynamics and Internal Structure of an Eruptive Prominence

B. Vršnak **127**, 129

- Large-Scale Distribution of Magnetic Fields, Green Corona and Prominences during an Extended Activity Cycle  
Václav Bumba, Vojtech Rušin, and Milan Rybanský **128**, 253
- Magnetic Field Configurations Which Can Produce Prominences with Inverse Polarity (*Letter*)  
U. Anzer **130**, 403
- Prominence Fine Structure. II: Diagnostics  
J. B. Zirker and S. Koutchmy **131**, 107
- Propagation of Sprays with Deceleration  
I. N. Garczyńska **131**, 129
- Prominences, Active**
- C iv Plasma Flow near Active Region Filaments  
R. Grant Athay **126**, 135
- Oscillatory Motions in an Active Prominence  
B. Vršnak, V. Ruždjak, R. Brajša, and F. Zloch **127**, 119
- Prominences, Dynamics**
- Propagation of Sprays with Deceleration  
I. N. Garczyńska **131**, 129
- Prominences, Eruptive**
- Magnetic Field Evolution during Prominence Eruptions and Two-Ribbon Flares  
E. R. Priest and T. G. Forbes **126**, 319
- Oscillatory Motions in an Active Prominence  
B. Vršnak, V. Ruždjak, R. Brajša, and F. Zloch **127**, 119
- Dynamics and Internal Structure of an Eruptive Prominence  
B. Vršnak **127**, 129
- Filament Eruption and Storm Radiation at Meter-Decameter Wavelengths  
M. R. Kundu and N. Gopalswamy **129**, 133
- Eruptive Instability of Cylindrical Prominences  
B. Vršnak **129**, 295
- BEARALERTS: A Successful Flare Prediction System  
Harold Zirin and William Marquette **131**, 149
- Prominences, Formation (see Prominences)**
- Prominences, Loop (see Flares, Loop)**
- Prominences, Magnetic Fields (see Prominences)**
- Prominences, Models**
- A Model for Quiescent Solar Prominences with Normal Polarity  
A. W. Hood and U. Anzer **126**, 117
- Magnetic Field Evolution during Prominence Eruptions and Two-Ribbon Flares  
E. R. Priest and T. G. Forbes **126**, 319
- Prominence Fine Structure  
J. B. Zirker and S. Koutchmy **127**, 109
- Eruptive Instability of Cylindrical Prominences  
B. Vršnak **129**, 295
- Thermal Instability in Slab Geometry in the Presence of Anisotropic Thermal Conduction  
R. A. M. van der Linden and M. Goossens **131**, 79
- Prominence Fine Structure. II: Diagnostics  
J. B. Zirker and S. Koutchmy **131**, 107
- Prominences, Quiescent**
- A Model for Quiescent Solar Prominences with Normal Polarity  
A. W. Hood and U. Anzer **126**, 117
- Prominence Fine Structure  
J. B. Zirker and S. Koutchmy **127**, 109
- Prominences, Spray (see Prominences)**
- Prominences, Temperature (see Prominences, Models)**

**Radiative Flux** (*see Solar Irradiance*)**Radiative Processes**

Comparison of Thermal and Nonthermal Hard X-Ray Emission in Electron-Heated Solar Flares

Peng Li and A. Gordon Emslie **129**, 113

On a New Class of Impulsive Flares with No Nuclear  $\gamma$ -Ray Line Emission (*Letter*)

F.-W. Bech, J. Steinacker, and R. Schlickeiser **129**, 195

A Mechanism for Producing Plasma Radiation in the GigaHertz Range by Precipitating High-Energy Protons

D. F. Smith and A. O. Benz **131**, 351

**Radio Bursts**

Thermodiffusional Small-Scale Irregularities in the Plasma Turbulence Region and Solar Radio Spikes (*Letter*)

L. G. Genkin, L. M. Erukhimov, and B. N. Levin **128**, 423

Proceedings of the CESRA Workshop on 'Particle Beams in the Solar Atmosphere' held at Braunwald (Switzerland), August 21-25, 1989, *Table of Contents*

**130**, v

Proceedings of the CESRA Workshop on 'Particle Beams in the Solar Atmosphere' held at Braunwald (Switzerland), August 21-25, 1989, *Preface*

A. O. Benz and A. Magun **130**, 1

Hard X-Rays and Associated Weak Decimetric Bursts

H. S. Sawant, C. J. B. Lattari, A. O. Benz, and B. R. Dennis **130**, 57

A Mechanism for Producing Plasma Radiation in the GigaHertz Range by Precipitating High-Energy Protons

D. F. Smith and A. O. Benz **131**, 351

**Radio Bursts, Association with Flares**

Multiple Moving Magnetic Structures in the Solar Corona

N. Gopalswamy and M. R. Kundu **128**, 377

UVSP and VLA Observations of the 24 June 1980 Flare: Asymmetric or Isotropic Beaming?

M. R. Kundu, C. C. Cheng, and E. J. Schmahl **129**, 343

On the Complex Spatial Structure of a Gradual Microwave Burst

V. M. Bogod, A. N. Korzhavin, Sh. B. Akhmedov, H. Aurass, J. Hildebrandt, and A. Krüger **129**, 351

The Role of the Magnetic Field in Intensity and Geometry in the Type III Burst Generation

P. Zlobec, V. Ruždjak, B. Vršnak, M. Karlický, and M. Messerotti **130**, 31

Type III Radio Burst Productivity of Solar Flares: I. Release of Energetic Electrons out of the Flare Site

M. Poquérusse and P. S. McIntosh **130**, 101

Electron Beams and Associated Rapid Fluctuations in Solar Flares

C. S. Li, Q. J. Fu, and H. W. Li **131**, 337

**Radio Bursts, Decimeter** (*see Radio Bursts*)**Radio Bursts, Dekameter** (*see Radio Bursts, Meter-Wavelengths and Longer*)**Radio Bursts, Dynamic Spectrum**

Microbursts at Meter-Decameter Wavelengths

G. Thejappa, N. Gopalswamy, and M. R. Kundu **127**, 165

Filament Eruption and Storm Radiation at Meter-Decameter Wavelengths

M. R. Kundu and N. Gopalswamy **129**, 133

On the Complex Spatial Structure of a Gradual Microwave Burst

V. M. Bogod, A. N. Korzhavin, Sh. B. Akhmedov, H. Aurass, J. Hildebrandt, and A. Krüger **129**, 351

The Harmonic Structure of a Type II Burst on 12 May, 1983

L. M. Bakunin, V. G. Ledenev, T. Kosugi, and D. J. McLean **129**, 379

Whistlers in the Solar Corona and Their Relevance to Fine Structures of Type IV Radio Emission

G. P. Chernov **130**, 75

Polarisation of Type III Bursts between 164 and 435 MHz: Structure and Variation with Frequency

C. Mercier **130**, 119

Fine Structure in Solar Microwave Bursts

M. A. F. Allaart, J. van Nieuwkoop, C. Slottje, and L. H. Sondaar **130**, 183

**Radio Bursts, Meter-Wavelengths and Longer (m, dkm, hm, km)**

A Note on the Emission Mechanism of Storm Radiation

N. Gopalswamy **126**, 367

### Microbursts at Meter-Decameter Wavelengths

G. Thejappa, N. Gopalswamy, and M. R. Kundu **127**, 165

A Study of the Spectrum and the Polarization of the Noise Storm Continua between 234 and 40 MHz

A. Böhme **128**, 399

Filament Eruption and Storm Radiation at Meter-Decameter Wavelengths

M. R. Kundu and N. Gopalswamy **129**, 133

Analysis of the Time Profile of Type III Bursts at Meter Wavelengths

A. Abrami, M. Messerotti, P. Zlobec, and M. Karlický **130**, 131

### Radio Bursts, Microwave (mm, cm)

On the Interpretation of the 2.84 GHz Solar UFFS Data of May 16, 1981

Zheng Le-Ping and Liu Yu-Ying **129**, 127

On the Complex Spatial Structure of a Gradual Microwave Burst

V. M. Bogod, A. N. Korzhavin, Sh. B. Akhmedov, H. Aurass, J. Hildebrandt, and A. Krüger **129**, 351

MHD Oscillations in Radio Spike Radiation Observed on May 16, 1981

Zhao Ren-Yang, Jin Sheng-Zhen, Fu Qi-Jun, and Li Xiao-Cong **130**, 151

Fine Structures in Solar Radio Bursts at a 21 cm Wavelength and Pulsation Modulation

Fu Qi-Jun, Gong Yuan-Fang, Jin Sheng-Zhen, and Zhao Ren-Yang **130**, 161

Spike Observations in Flares in China

Jin Sheng-Zhen, Fu Qi-Jun, Zhao Ren-Yang, and Hu Chu-Min **130**, 175

Fine Structure in Solar Microwave Bursts

M. A. F. Allaart, J. van Nieuwkoop, C. Slottje, and L. H. Sondaar **130**, 183

On the Relation between the Peak Frequency and the Corresponding Rise Time of Solar Microwave Impulsive Bursts and the Height Dependence of Magnetic Fields

Zhao Ren-Yang, Andreas Magun, and Erwin Schanda **130**, 361

Electron Beams and Associated Rapid Fluctuations in Solar Flares

C. S. Li, Q. J. Fu, and H. W. Li **131**, 337

### Radio Bursts, Stellar (*see Stellar Physics*)

### Radio Bursts, Theory (*see Radio Emission, Theory*)

#### Radio Bursts, Type I

A Study of the Spectrum and the Polarization of the Noise Storm Continua between 234 and 40 MHz

A. Böhme **128**, 399

Particle Beams as a Source of Noise Storm Depression?

H. Aurass, A. Böhme, and M. Karlický **130**, 19

#### Radio Bursts, Type II

The Harmonic Structure of a Type II Burst on 12 May, 1983

L. M. Bakunin, V. G. Ledenev, T. Kosugi, and D. J. McLean **129**, 379

Interplanetary Particle Beams

G. A. Dulk **130**, 139

#### Radio Bursts, Type III

A Study of the Spectrum and the Polarization of the Noise Storm Continua between 234 and 40 MHz

A. Böhme **128**, 399

Particle Beams in the Solar Atmosphere: General Overview

D. B. Melrose **130**, 3

The Role of the Magnetic Field in Intensity and Geometry in the Type III Burst Generation

P. Zlobec, V. Ruždjak, B. Vršnak, M. Karlický, and M. Messerotti **130**, 31

Flare Fragmentation and Type III Productivity in the 1980 June 27 Flare

M. J. Aschwanden, A. O. Benz, R. A. Schwartz, R. P. Lin, R. M. Pelling, and W. Stehling **130**, 39

Hard X-Rays and Associated Weak Decimetric Bursts

H. S. Sawant, C. J. B. Lattari, A. O. Benz, and B. R. Dennis **130**, 57

Observations of Beam Propagation

M. Pick and G. H. J. van den Oord **130**, 83

Type III Radio Burst Productivity of Solar Flares: I. Release of Energetic Electrons out of the Flare Site

M. Poquérousse and P. S. McIntosh **130**, 101



Polarisation of Type III Bursts between 164 and 435 MHz: Structure and Variation with Frequency

C. Mercier **130**, 119

Analysis of the Time Profile of Type III Bursts at Meter Wavelengths

A. Abrami, M. Messerotti, P. Zlobec, and M. Karlický **130**, 131

Interplanetary Particle Beams

G. A. Dulk **130**, 139

Electron Beam Formation and Stability

L. Muschietti **130**, 201

Electron Beams and Associated Rapid Fluctuations in Solar Flares

C. S. Li, Q. J. Fu, and H. W. Li **131**, 337

## **Radio Bursts, Type IV**

Multiple Moving Magnetic Structures in the Solar Corona

N. Gopalswamy and M. R. Kundu **128**, 377

Whistlers in the Solar Corona and Their Relevance to Fine Structures of Type IV Radio Emission

G. P. Chernov **130**, 75

## **Radio Bursts, Type V (see Radio Bursts)**

## **Radio Emission, Active Regions**

Microbursts at Meter-Decameter Wavelengths

G. Thejappa, N. Gopalswamy, and M. R. Kundu **127**, 165

The Origin of the 10.7 cm Flux

K. F. Tapping and B. DeTracey **127**, 321

## **Radio Emission, Models**

The Origin of the 10.7 cm Flux

K. F. Tapping and B. DeTracey **127**, 321

Multiple Moving Magnetic Structures in the Solar Corona

N. Gopalswamy and M. R. Kundu **128**, 377

Particle Beams as a Source of Noise Storm Depression?

H. Aurass, A. Böhme, and M. Karlický **130**, 19

Whistlers in the Solar Corona and Their Relevance to Fine Structures of Type IV Radio Emission

G. P. Chernov **130**, 75

Observations of Beam Propagation

M. Pick and G. H. J. van den Oord **130**, 83

On the Relation between the Peak Frequency and the Corresponding Rise Time of Solar Microwave Impulsive Bursts and the Height Dependence of Magnetic Fields

Zhao Ren-Yang, Andreas Magun, and Erwin Schanda **130**, 361

Electron Beams and Associated Rapid Fluctuations in Solar Flares

C. S. Li, Q. J. Fu, and H. W. Li **131**, 337

## **Radio Emission, S-Component**

The Origin of the 10.7 cm Flux

K. F. Tapping and B. DeTracey **127**, 321

On the Complex Spatial Structure of a Gradual Microwave Burst

V. M. Bogod, A. N. Korzhavin, Sh. B. Akhmedov, H. Aurass, J. Hildebrandt, and A. Krüger **129**, 351

## **Radio Emission, Stellar (see Stellar Physics)**

## **Radio Emission, Theory**

A Note on the Emission Mechanism of Storm Radiation

N. Gopalswamy **126**, 367

Microbursts at Meter-Decameter Wavelengths

G. Thejappa, N. Gopalswamy, and M. R. Kundu **127**, 165

Thermomagnetic Small-Scale Irregularities in the Plasma Turbulence Region and Solar Radio Spikes (*Letter*)

L. G. Genkin, L. M. Erukhimov, and B. N. Levin **128**, 423

The Harmonic Structure of a Type II Burst on 12 May, 1983

L. M. Bakunin, V. G. Ledenev, T. Kosugi, and D. J. McLean **129**, 379

MHD Oscillations in Radio Spike Radiation Observed on May 16, 1981

Zhao Ren-Yang, Jin Sheng-Zhen, Fu Qi-Jun, and Li Xiao-Cong **130**, 151

- A Mechanism for Producing Plasma Radiation in the GigaHertz Range by Precipitating High-Energy Protons  
D. F. Smith and A. O. Benz **131**, 351

### Rotation

- Cluster Analysis of the Space-Time Distribution of Sunspot Groups during Solar Cycle No. 20  
Kristóf Petrovay and Bashir K. Abuzeid **131**, 231
- The Magnetic Fields of Active Regions. IV: Meridional Motions  
Robert F. Howard **131**, 259

### Rotation, Differential

- Solar Differential Rotation Derived from Sunspot Observations  
Maspol Aini Kambry and Jun Nishikawa **126**, 89
- The Magnetic Fields of Active Regions: II. Rotation  
Robert F. Howard **126**, 299
- Sunspots: Their Rotation, Their Expansion in the Activity Zone, Their Links with the Giant Convective Cells  
Maurizio Ternullo **127**, 29
- The Nonlinear Solar Dynamo and Differential Rotation: A Taylor Number Puzzle?  
A. Brandenburg, D. Moss, G. Rüdiger, and I. Tuominen **128**, 243
- Periodicities in the Green Corona for the Sun as a Star  
Vojtech Rušin and Juraj Zverko **128**, 261
- Angular Velocity Distribution in Convective Regions and the Origin of Solar Differential Rotation  
G. S. Bisnovaty-Kogan **128**, 299
- Solar Surface Velocity Fields Determined from Small Magnetic Features  
R. F. Howard, J. W. Harvey, and S. Forgach **130**, 295
- Cluster Analysis of the Space-Time Distribution of Sunspot Groups during Solar Cycle No. 20  
Kristóf Petrovay and Bashir K. Abuzeid **131**, 231

### Rotation, Stellar (*see Stellar Physics*)

### Scattered Light (*see Instrumental Effects*)

### Solar Cycle

- Solar Differential Rotation Derived from Sunspot Observations  
Maspol Aini Kambry and Jun Nishikawa **126**, 89
- Solar Proton Events during Solar Cycles 19, 20, 21  
J. Feynman, T. P. Armstrong, L. Dao-Gibner, and S. Silverman **126**, 385
- On Forecasting the Sunspot Numbers (*Letter*)  
J. Kurths and A. A. Ruzmaikin **126**, 407
- The Reversal of the Solar Polar Magnetic Fields. I: The Surface Transport of Magnetic Flux  
P. R. Wilson, P. S. McIntosh, and H. B. Snodgrass **127**, 1
- Sunspots: Their Rotation, Their Expansion in the Activity Zone, Their Links with the Giant Convective Cells  
Maurizio Ternullo **127**, 29
- Evidence for Solar-Cycle Evolution of North-South Flare Asymmetry during Cycles 20 and 21  
Howard A. Garcia **127**, 185
- On the Maximum Rate of Change in Sunspot Number Growth and the Size of the Sunspot Cycle  
Robert M. Wilson **127**, 199
- The 1989 Solar Terrestrial Predictions Workshop  
Richard Thompson **127**, 207
- Radiocarbon Evidence of the Global Stochasticity of Solar Activity  
S. M. Gizzatullina, V. D. Rukavishnikov, A. A. Ruzmaikin, and K. S. Tavastsherna **127**, 281
- A Summary of Major Solar Proton Events  
M. A. Shea and D. F. Smart **127**, 297
- On the Solar Origin of the Thermoluminescence Profile of the GT14 Core  
G. Cini Castagnoli, G. Bonino, A. Provenzale, and M. Serio **127**, 357
- Period and Phase of the 88-Year Solar Cycle and the Maunder Minimum: Evidence for a Chaotic Sun  
J. Feynman and Stephen B. Gabriel **127**, 393
- On the Dimension of Solar Attractor  
V. M. Ostryakov and I. G. Usoskin **127**, 405
- Solar Activity in the Past and the Problem of Solar Dynamo  
V. Dermendjiev, Y. Shopov, and G. Buyukliev **128**, 217

- Large-Scale Distribution of Magnetic Fields, Green Corona and Prominences during an Extended Activity Cycle  
Václav Bumba, Vojtech Rušin, and Milan Rybanský **128**, 253
- Periodicities in the Green Corona for the Sun as a Star  
Vojtech Rušin and Juraj Zverko **128**, 261
- 160 Minute Solar Variations and the 22 Year Cycle  
V. A. Kotov and T. T. Tsap **128**, 269
- Periodicities of Solar Irradiance and Solar Activity Indices, I  
Judit Pap, W. Kent Tobiska, and S. David Bouwer **129**, 165
- A Two-Component Solar Cycle  
J. P. Legrand and P. A. Simon **131**, 187
- Can Variations of Sunspot Number Be Related to Those of the Solar Neutrino Flux? (*Letter*)  
Y. V. Vandakurov **131**, 407
- Aurorae Borealis Lag during the Maunder Minimum (*Letter*)  
Ludwig Schlamming **131**, 411

### Solar Cycle, Models

- Radiocarbon Evidence of the Global Stochasticity of Solar Activity  
S. M. Gizzatullina, V. D. Rukavishnikov, A. A. Ruzmaikin, and K. S. Tavastsherna **127**, 281
- Period and Phase of the 88-Year Solar Cycle and the Maunder Minimum: Evidence for a Chaotic Sun  
J. Feynman and Stephen B. Gabriel **127**, 393
- On the Dimension of Solar Attractor  
V. M. Ostryakov and I. G. Usoskin **127**, 405
- The Nonlinear Solar Dynamo and Differential Rotation: A Taylor Number Puzzle?  
A. Brandenburg, D. Moss, G. Rüdiger, and I. Tuominen **128**, 243
- Large-Scale Flows Excited by Magnetic Fields in the Solar Convective Zone  
N. I. Kleorin and A. A. Ruzmaikin **131**, 211

### Solar Diameter

- Solar Astrometry by Photolithography  
G. Artzner **128**, 281

### Solar Irradiance

- The 'Sun in Time Conference', held in Tucson, Arizona, U.S.A. March 6-10, 1989, *Introduction*  
Charles P. Sonett and Mark S. Giampapa **127**, 295
- Sun's Inertial Motion and Luminosity  
James H. Shirley, Kenneth R. Sperber, and Rhodes W. Fairbridge **127**, 379
- Periodicities in the Green Corona for the Sun as a Star  
Vojtech Rušin and Juraj Zverko **128**, 261
- Periodicities of Solar Irradiance and Solar Activity Indices, I  
Judit Pap, W. Kent Tobiska, and S. David Bouwer **129**, 165
- Thirteen-Day Periodicity and the Center-to-Limb Dependence of UV, EUV, and X-Ray Emission of Solar Activity  
R. F. Donnelly and L. C. Puga **130**, 369

### Solar-Stellar Connection (*see Stellar Physics*)

### Solar Wind

- Space-Based Measurements of Elemental Abundances and Their Relation to Solar Abundances  
M. A. Coplan, K. W. Ogilvie, P. Bochsler, and J. Geiss **128**, 195
- The Abundance of <sup>3</sup>He in the Solar Wind - a Constraint for Models of Solar Evolution  
P. Bochsler, J. Geiss, and A. Maeder **128**, 203
- Interplanetary Particle Beams  
G. A. Dulk **130**, 139

### Solar Wind, Abundances (*see Solar Wind; Abundances*)

### Solar Wind, Disturbances of Solar Origin

- The 1989 Solar Terrestrial Predictions Workshop  
Richard Thompson **127**, 207

### Solar Wind, Dynamics (*see Velocity Fields, Solar Wind*)

**Solar Wind, Flare-Associated Disturbances** (*see Solar Wind, Disturbances of Solar Origin*)

**Solar Wind, Interaction with Earth, Moon, Planets, Comets** (*see Solar Wind*)

**Solar Wind, Magnetic Fields** (*see Magnetic Fields, Interplanetary*)

**Solar Wind, Models**

MHD Study of Temporal and Spatial Evolution of Simulated Interplanetary Shocks in the Ecliptic Plane within 1 AU

Zdenka Smith and Murray Dryer 129, 387

Numerical Simulations of High-Speed Solar Wind Streams within 1 AU and Their Signatures at 1 AU

Z. Smith and M. Dryer 131, 363

**Solar Wind, Non-Flare-Associated Disturbances** (*see Solar Wind, Disturbances of Solar Origin*)

**Solar Wind, Sector Structure** (*see Magnetic Fields, Interplanetary Sector Structure*)

**Solar Wind, Shock Waves**

Spectral Line and White-Light Intensities in the Corona in the Presence of Propagating or Standing Shocks

Ruth Esser and Shadia Rifai Habbal 129, 153

MHD Study of Temporal and Spatial Evolution of Simulated Interplanetary Shocks in the Ecliptic Plane within 1 AU

Zdenka Smith and Murray Dryer 129, 387

**Solar Wind, Spectrum** (*see Solar Wind*)

**Solar Wind, Streams** (*see Velocity Fields, Solar Wind*)

**Spectral Line, Asymmetries** (*see Spectral Line, Profiles*)

**Spectral Line, Broadening**

Collisional Broadening and Shift of the Alkali Resonance Lines

V. Andretta, M. T. Gomez, and G. Severino 131, 1

The Detection of Wave Activity in the Solar Corona Using UV Line Spectra

K. G. McClements, R. A. Harrison, and D. Alexander 131, 41

**Spectral Line, Formation in Magnetic Field**

A Diagnostic Method for Probing the Possible Twist of Magnetic Field Lines in Sunspots

Ye Shi-Hui and Jin Jie-Hai 129, 247

Velocities and Magnetic Fields Observed in a Sunspot

P. Arena, E. Landi Degl'Innocenti, and G. Noci 129, 259

**Spectral Line, Identification**

An Explanation of the 'Granulation Boundary' in the HR Diagram

Cornelis de Jager 126, 201

The Interpretation of the Spectral Line Intensities from the CHASE Spectrometer on Spacelab 2

J. Lang, H. E. Mason, and R. W. P. McWhirter 129, 31

**Spectral Line, Intensity**

N IV Line Ratios in the Sun

F. P. Keenan 126, 311

A Comparison of Theoretical S v Emission Line Strengths with Extreme Ultraviolet Observations of a Sunspot

F. P. Keenan and J. G. Doyle 128, 345

The Interpretation of the Spectral Line Intensities from the CHASE Spectrometer on Spacelab 2

J. Lang, H. E. Mason, and R. W. P. McWhirter 129, 31

Spectral Line and White-Light Intensities in the Corona in the Presence of Propagating or Standing Shocks

Ruth Esser and Shadia Rifai Habbal 129, 153

Forbidden Line Ratios from Si VIII and S X Coronal Ions

B. N. Dwivedi 131, 49

Theoretical Emission Line Strengths for Ne VII Compared to EUV Solar Observations

F. P. Keenan 131, 291

**Spectral Line, Profiles**

An Explanation of the 'Granulation Boundary' in the HR Diagram

Cornelis de Jager 126, 201



- Fabry-Pérot Line Profiles in the  $\lambda 5303$  Å and  $\lambda 6373$  Å Coronal Lines Obtained during the 1983 Indonesian Eclipse  
T. Chandrasekhar, J. N. Desai, N. M. Ashok, and Jay M. Pasachoff **131**, 25

### Spectral Line, Theory

- N IV Line Ratios in the Sun  
F. P. Keenan **126**, 311
- The Interpretation of the Spectral Line Intensities from the CHASE Spectrometer on Spacelab 2  
J. Lang, H. E. Mason, and R. W. P. McWhirter **129**, 31
- Spectral Line and White-Light Intensities in the Corona in the Presence of Propagating or Standing Shocks  
Ruth Esser and Shadia Rifai Habbal **129**, 153
- The Detection of Wave Activity in the Solar Corona Using UV Line Spectra  
K. G. McClements, R. A. Harrison, and D. Alexander **131**, 41
- Theoretical Emission Line Strengths for Ne VII Compared to EUV Solar Observations  
F. P. Keenan **131**, 291

### Spectrum, Extreme-Ultraviolet

- The Interpretation of the Spectral Line Intensities from the CHASE Spectrometer on Spacelab 2  
J. Lang, H. E. Mason, and R. W. P. McWhirter **129**, 31
- Theoretical Emission Line Strengths for Ne VII Compared to EUV Solar Observations  
F. P. Keenan **131**, 291

### Spectrum, $\gamma$ -Ray

- On a New Class of Impulsive Flares with No Nuclear  $\gamma$ -Ray Line Emission (*Letter*)  
F.-W. Bech, J. Steinacker, and R. Schlickeiser **129**, 195

### Spectrum, Stellar (*see Stellar Physics*)

### Spectrum, Visible

- An Explanation of the 'Granulation Boundary' in the HR Diagram  
Cornelis de Jager **126**, 201

### Spicules

- The Formation of Spicules in the Course of the Chromospheric Network Magnetic Field Reconnection  
A. D. Pataraya, A. L. Taktakishvili, and B. B. Chargeishvili **128**, 333

### Stars (*see Stellar Physics*)

### Stellar Activity Cycles (*see Stellar Physics*)

### Stellar Physics

- The 'Sun in Time Conference', held in Tucson, Arizona, U.S.A. March 6-10, 1989, *Introduction*  
Charles P. Sonett and Mark S. Giampapa **127**, 295
- Zeeman-Doppler Imaging: a New Option for Magnetic Field Study of Ap and Solar-Type Stars  
J.-F. Donati and M. Semel **128**, 227
- Angular Momentum Transport in Pre-Main-Sequence Stars of Intermediate Mass  
C. Vigneron, A. Mangeney, C. Catala, and E. Schatzman **128**, 287
- Radio Emission from Flares Stars  
T. S. Bastian **130**, 265
- Meter-Decameter Observations of dMe Flare Stars with the Clark Lake Radio Telescope  
P. D. Jackson, M. R. Kundu, and N. Kassim **130**, 391
- Magnetostatic Equilibria for Coronal Loops on Rotating Stars  
M. Jardine and A. Collier Cameron **131**, 269

### Stellar Winds and Mass Loss (*see Stellar Physics*)

### Subgranular Structures (*see Intergranular Region and Subgranular Structures*)

### Sunspots

- Solar Differential Rotation Derived from Sunspot Observations  
Maspol Aini Kambry and Jun Nishikawa **126**, 89

**Helioseismic Imaging of Sunspots at Their Antipodes**

Charles Lindsey and Douglas C. Braun 126, 101

**Sunspots: Their Rotation, Their Expansion in the Activity Zone, Their Links with the Giant Convective Cells**

Maurizio Ternullo 127, 29

**A Comparison of Theoretical S v Emission Line Strengths with Extreme Ultraviolet Observations of a Sunspot**

F. P. Keenan and J. G. Doyle 128, 345

**p-Mode Absorption in the Giant Active Region of 10 March, 1989**

D. C. Braun and T. L. Duvall, Jr. 129, 83

**On the Umbra-Penumbra Area Ratio of Sunspots (*Letter*)**

P. N. Brandt, W. Schmidt, and M. Steinegger 129, 191

**Sunspot Nests as Traced by a Cluster Analysis**

M. P. Brouwer and C. Zwaan 129, 221

**A Diagnostic Method for Probing the Possible Twist of Magnetic Field Lines in Sunspots**

Ye Shi-Hui and Jin Jie-Hai 129, 247

**Absorption of Acoustic Waves in Monolithic and Fibril Sunspot Models**

C. S. Rosenthal 130, 313

**Sunspots, Evershed Effect (*see Sunspots, Velocity*)****Sunspots, Evolution (*see Sunspots*)****Sunspots, Magnetic Fields****A Diagnostic Method for Probing the Possible Twist of Magnetic Field Lines in Sunspots**

Ye Shi-Hui and Jin Jie-Hai 129, 247

**Velocities and Magnetic Fields Observed in a Sunspot**

P. Arena, E. Landi Degl'Innocenti, and G. Noci 129, 259

**Sunspots, Models****Resonant Oscillations in Sunspot Umbrae**

W. P. Wood 128, 353

**Sunspots, Penumbra****On the Umbra-Penumbra Area Ratio of Sunspots (*Letter*)**

P. N. Brandt, W. Schmidt, and M. Steinegger 129, 191

**Sunspots, Proper Motion (*see Sunspots, Velocity*)****Sunspots, Spectrum****A Comparison of Theoretical S v Emission Line Strengths with Extreme Ultraviolet Observations of a Sunspot**

F. P. Keenan and J. G. Doyle 128, 345

**Sunspots, Statistics****On the Maximum Rate of Change in Sunspot Number Growth and the Size of the Sunspot Cycle**

Robert M. Wilson 127, 199

**Sunspots, Temperature (*see Sunspots, Models*)****Sunspots, Umbra****Resonant Oscillations in Sunspot Umbrae**

W. P. Wood 128, 353

**On the Umbra-Penumbra Area Ratio of Sunspots (*Letter*)**

P. N. Brandt, W. Schmidt, and M. Steinegger 129, 191

**Sunspots, Velocity****Asymmetric Flux Loops in Active Regions: I**

L. van Driel-Gesztelyi and K. Petrovay 126, 285

**Velocities and Magnetic Fields Observed in a Sunspot**

P. Arena, E. Landi Degl'Innocenti, and G. Noci 129, 259

**Sunspots, Wilson Effect (*see Sunspots*)****Supergranulation****The Formation of Spicules in the Course of the Chromospheric Network Magnetic Field Reconnection**

A. D. Pataraya, A. L. Taktakishvili, and B. B. Chargeishvili 128, 333

**Surges****X-Ray Bright Surges**

Zdeněk Švestka, František Fárník, and Frances Tang **127**, 149

**High Latitude Helical Surge of May 22, 1989**

Adnan Ökten and Hikmet Çakmak **128**, 365

**An Analysis of Surges Triggered by a Small Flare**

Ágnes Kovács and L. Dezső **129**, 313

**Transition Region****Force and Energy Balance in the Transition Region Network**

R. A. S. Fiedler and P. S. Cally **126**, 69

**Transition Region, Models (see *Transition Region*)****Transition Region, Stellar (see *Stellar Physics*)****Velocity Fields****C IV Plasma Flow near Active Region Filaments**

R. Grant Athay **126**, 135

**An Explanation of the ‘Granulation Boundary’ in the HR Diagram**

Cornelis de Jager **126**, 201

**Sunspots: Their Rotation, Their Expansion in the Activity Zone, Their Links with the Giant Convective Cells**

Maurizio Ternullo **127**, 29

**Angular Velocity Distribution in Convective Regions and the Origin of Solar Differential Rotation**

G. S. Bisnovatyi-Kogan **128**, 299

**Azimuthal Convective Rolls and the Subsurface Magnetic Field**

William J. Merryfield **128**, 305

**Solar Surface Velocity Fields Determined from Small Magnetic Features**

R. F. Howard, J. W. Harvey, and S. Forgach **130**, 295

**The Evolution of Coronal Magnetic Fields (*Letter*)**

E. R. Priest and T. G. Forbes **130**, 399

**Fabry-Pérot Line Profiles in the  $\lambda 5303$  Å and  $\lambda 6373$  Å Coronal Lines Obtained during the 1983**

Indonesian Eclipse

T. Chandrasekhar, J. N. Desai, N. M. Ashok, and Jay M. Pasachoff **131**, 25

**Large-Scale Flows Excited by Magnetic Fields in the Solar Convective Zone**

N. I. Kleeorin and A. A. Ruzmaikin **131**, 211

**The Magnetic Fields of Active Regions. IV: Meridional Motions**

Robert F. Howard **131**, 259

**Velocity Fields, Corona (see *Velocity Fields*)****Velocity Fields, Interior (see *Velocity Fields*)****Velocity Fields, Large Scale (see *Velocity Fields*)****Velocity Fields, Meridional (see *Velocity Fields*)****Velocity Fields, Oscillations (see *Oscillations, Velocity*)****Velocity Fields, Photosphere****Velocity Pattern of Small Scale Magnetic Fields (*Letter*)**

H. C. Dara, C. E. Alissandrakis, and S. Koutchmy **126**, 403 *Erratum 128*, 431

**Properties of the Large- and Small-Scale Flow Patterns in and around AR 19824**

C. J. Schrijver and S. F. Martin **129**, 95

**Solar Surface Velocity Fields Determined from Small Magnetic Features**

R. F. Howard, J. W. Harvey, and S. Forgach **130**, 295

**Large-Scale Flows Excited by Magnetic Fields in the Solar Convective Zone**

N. I. Kleeorin and A. A. Ruzmaikin **131**, 211

**Velocity Fields, Solar Wind****Magnetic Field Configurations Associated with Fast Solar Wind**

N. R. Sheeley, Jr. and Y.-M. Wang **131**, 165

**A Two-Component Solar Cycle**J. P. Legrand and P. A. Simon **131**, 187**Numerical Simulations of High-Speed Solar Wind Streams within 1 AU and Their Signatures at 1 AU**Z. Smith and M. Dryer **131**, 363**On the High-Speed Plasma Streams, Stormtime Sudden Commencements and Cosmic-Ray Intensity: Relation amongst Them during Epoch 1978 to 1982**D. Venkatesan and B. Y. Zhu **131**, 385**Velocity Fields, Transition Region (See *Velocity Fields; Transition Region*)****Waves****Absorption of Acoustic Waves in Monolithic and Fibril Sunspot Models**C. S. Rosenthal **130**, 313**Waves, Acoustic****Absorption of Acoustic Waves in Monolithic and Fibril Sunspot Models**C. S. Rosenthal **130**, 313**The Detection of Wave Activity in the Solar Corona Using UV Line Spectra**K. G. McClements, R. A. Harrison, and D. Alexander **131**, 41**Waves, Alfvén****The Detection of Wave Activity in the Solar Corona Using UV Line Spectra**K. G. McClements, R. A. Harrison, and D. Alexander **131**, 41**Discrete Alfvén Waves in Solar Loop Prominences**Carlos A. de Azevedo, Altair S. de Assis, Hisataki Shigueoka, and Paulo H. Sakanaka **131**, 119**Waves, Dispersion (see *Waves*)****Waves, Dissipation (see *Waves*)****Waves, Generation (see *Waves*)****Waves, Gravity (see *Waves, Modes*)****Waves, Hydromagnetic (see *Waves, Modes*)****Waves, Magnetohydrodynamic (see *Waves, Modes*)****Waves, Modes****Magneto-Atmospheric Waves**Toufik E. Abdelatif **129**, 201**MHD Oscillations in Radio Spike Radiation Observed on May 16, 1981**Zhao Ren-Yang, Jin Sheng-Zhen, Fu Qi-Jun, and Li Xiao-Cong **130**, 151**Viscous Damping of Surface Magnetohydrodynamic Waves on Magnetic Interface in Cold Plasmas**M. S. Ruderman **131**, 11**Waves, Moreton (see *Waves, Modes*)****Waves, Plasma****Electron Beam Formation and Stability**L. Muschietti **130**, 201**Waves, Propagation****Viscous Damping of Surface Magnetohydrodynamic Waves on Magnetic Interface in Cold Plasmas**M. S. Ruderman **131**, 11**Waves, Shock****Spectral Line and White-Light Intensities in the Corona in the Presence of Propagating or Standing Shocks**Ruth Esser and Shadia Rifai Habbal **129**, 153**X-Ray Bursts****Comparison of Thermal and Nonthermal Hard X-Ray Emission in Electron-Heated Solar Flares**Peng Li and A. Gordon Emslie **129**, 113**X-Ray Bursts, Association with Flares****UVSP and VLA Observations of the 24 June 1980 Flare: Asymmetric or Isotropic Beaming?**M. R. Kundu, C. C. Cheng, and E. J. Schmahl **129**, 343



H $\alpha$  Line Profile Observations of a Limb Flare with High Temporal Resolution

M. Graeter **130**, 337

Stereoscopic Measurements of Flares from PHOBOS and GOES

Howard A. Garcia and František Fárník **131**, 137

**X-Ray Bursts, Association with Non-Flare Phenomena** (*see X-Ray Bursts*)

**X-Ray Bursts, Hard**

Impulsive Phase Heating by Uni-Directional Current Systems in Solar Flares

T. N. La Rosa **126**, 153

Plasma Motions in the Flare of 1982 June 6 (X12)

Tetsuya Watanabe **126**, 351

Comparison of Thermal and Nonthermal Hard X-Ray Emission in Electron-Heated Solar Flares

Peng Li and A. Gordon Emslie **129**, 113

UVSP and VLA Observations of the 24 June 1980 Flare: Asymmetric or Isotropic Beaming?

M. R. Kundu, C. C. Cheng, and E. J. Schmahl **129**, 343

Flare Fragmentation and Type III Productivity in the 1980 June 27 Flare

M. J. Aschwanden, A. O. Benz, R. A. Schwartz, R. P. Lin, R. M. Pelling, and W. Stehling **130**, 39

Hard X-Rays and Associated Weak Decimetric Bursts

H. S. Sawant, C. J. B. Lattari, A. O. Benz, and B. R. Dennis **130**, 57

On the Production of Hard X-Rays in Solar Flares

G. M. Simnett and M. G. Haines **130**, 253

H $\alpha$  Line Profile Observations of a Limb Flare with High Temporal Resolution

M. Graeter **130**, 337

Pulse Beam Heating of the Solar Atmosphere

Marian Karlický **130**, 347

Nonthermal Electrons in the Thick-Target Reverse-Current Model for Hard X-Ray Bremsstrahlung

Yu. E. Litvinenko and B. V. Somov **131**, 319

Electron Beams and Associated Rapid Fluctuations in Solar Flares

C. S. Li, Q. J. Fu, and H. W. Li **131**, 337

**X-Ray Bursts, Soft**

Investigation of Non-Uniform Heating during the Decay Phase of Solar Flares

B. Sylwester, J. Sylwester, R. D. Bentley, and A. Fludra **126**, 177

Stereoscopic Measurements of Flares from PHOBOS and GOES

Howard A. Garcia and František Fárník **131**, 137

**X-Ray Bursts, Spectrum**

Plasma Motions in the Flare of 1982 June 6 (X12)

Tetsuya Watanabe **126**, 351

**X-Ray Bursts, Theory**

Comparison of Thermal and Nonthermal Hard X-Ray Emission in Electron-Heated Solar Flares

Peng Li and A. Gordon Emslie **129**, 113

Simulation Studies of Electron Acceleration by Ion Ring Distributions in Solar Flares

K. G. McClements, J. J. Su, R. Bingham, J. M. Dawson, and D. S. Spicer **130**, 229

Pulse Beam Heating of the Solar Atmosphere

Marian Karlický **130**, 347

Nonthermal Electrons in the Thick-Target Reverse-Current Model for Hard X-Ray Bremsstrahlung

Yu. E. Litvinenko and B. V. Somov **131**, 319

**X-Ray Emission, Stellar** (*see Stellar Physics*)

**X-Ray Structures**

X-Ray Bright Surges

Zdeněk Švestka, František Fárník, and Frances Tang **127**, 149

Formation and Cooling of the Giant HXIS Arches of November 6-7, 1980

R. A. Kopp and G. Poletto **127**, 267

Real-Time Simulation of a Potential Magnetic Field in a Post-Flare Arch

Giannina Poletto and Zdeněk Švestka **129**, 363



*Name Index – Volumes 126–131*





- ABDELATIF, T. E. / Magneto-Atmospheric Waves **129**, 201
- ABOUDARHAM, J., J. C. HENOUX, J. C. BROWN, G. H. J. VAN DEN OORD, L. VAN DRIEL-GESZTELYI, and O. GERLEI / Effect of Electron Beams during Solar Flares **130**, 243
- ABRAMI, A., M. MESSEROTTI, P. ZLOBEC, and M. KARLICKÝ / Analysis of the Time Profile of Type III Bursts at Meter Wavelengths **130**, 131
- ABUZEID, B. K., *see* Petrovay, K.
- AI, G., *see* Wang, H. *et al.*
- AINI KAMBRY, M. and J. NISHIKAWA / Solar Differential Rotation Derived from Sunspot Observations **126**, 89
- AKHMEDOV, SH. B., *see* Bogod, V. M. *et al.*
- ALEXANDER, D., *see* Karlický, M. *et al.*
- ALEXANDER, D., *see* McClements, K. G. *et al.*
- ALISSANDRAKIS, C. E., *see* Dara, H. C. *et al.*
- ALISSANDRAKIS, C. E., *see* Dara, H. C. *et al.*
- ALISSANDRAKIS, C. E., *see* Georgakilas, A. A. *et al.*
- ALLAART, M. A. F., J. VAN NIEUWKOOP, C. SLOTTJE, and L. H. SONDAAR / Fine Structure in Solar Microwave Bursts **130**, 183
- ÁLVAREZ, M., *see* Jiménez, A. *et al.*
- ALVAREZ-MADRIGAL, M., *see* Mendoza, B. *et al.*
- ANDERSEN, B. N., *see* Appourchaux, T.
- ANDERSEN, N. B., *see* Jiménez, A. *et al.*
- ANDRETTA, V., M. T. GOMEZ, and G. SEVERINO / Collisional Broadening and Shift of the Alkali Resonance Lines **131**, 1
- ANGUERA GUBAU, M., P. L. PALLÉ, F. PÉREZ HERNÁNDEZ, and T. ROCA CORTÉS / An Attempt to Identify Low  $l$  - Low  $n$  Solar Acoustic Modes **128**, 79
- ANZER, U. / Magnetic Field Configurations Which Can Produce Prominences with Inverse Polarity **130**, 403 (*Letter*)
- ANZER, U., *see* Hood, A. W.
- APPOURCHAUX, T. and B. N. ANDERSEN / Observations of Low-Degree Solar Oscillations with Few Detector Elements **128**, 91
- ARENA, P., E. LANDI DEGL'INNOCENTI, and G. NOCI / Velocities and Magnetic Fields Observed in a Sunspot **129**, 259
- ARMSTRONG, T. P., *see* Feynman, J. *et al.*
- ARPESELLA, C., *see* Kovacs, T. *et al.*
- ARTZNER, G. / Solar Astrometry by Photolithography **128**, 281
- ASCHWANDEN, M. J., A. O. BENZ, R. A. SCHWARTZ, R. P. LIN, R. M. PELLING, and W. STEHLING / Flare Fragmentation and Type III Productivity in the 1980 June 27 Flare **130**, 39
- ASHOK, N. M., *see* Chandrasekhar, T. *et al.*
- ATHAY, R. G. / C IV Plasma Flow near Active Region Filaments **126**, 135
- AURASS, H., A. BÖHME, and M. KARLICKÝ / Particle Beams as a Source of Noise Storm Depression? **130**, 19
- AURASS, H., *see* Bogod, V. M. *et al.*
- BAKUNIN, L. M., V. G. LEDENEV, T. KOSUGI, and D. J. McLEAN / The Harmonic Structure of a Type II Burst on 12 May, 1983 **129**, 379
- BALMFORTH, N. J. and D. O. GOUGH / Mixing-Length Theory and the Excitation of Solar Acoustic Oscillations **128**, 161
- BALTHASAR, H. / The Oscillatory Behaviour of Solar Faculae **127**, 289 (*Letter*)
- BASTIAN, T. S. / Radio Emission from Flares Stars **130**, 265
- BECH, F.-W., J. STEINACKER, and R. SCHLICKEISER / On a New Class of Impulsive Flares with No Nuclear  $\gamma$ -Ray Line Emission **129**, 195 (*Letter*)
- BELLINI, G., *see* Kovacs, T. *et al.*
- BENTLEY, R. D., *see* Sylwester, B. *et al.*
- BENZ, A. O., *see* Aschwanden, M. J. *et al.*
- BENZ, A. O., *see* Sawant, H. S. *et al.*
- BENZ, A. O., *see* Smith, D. F.
- BERTHOMIEU, G., *see* Morel, P. *et al.*
- BERTHOMIEU, G., *see* Provost, J. *et al.*
- BINGHAM, R., *see* McClements, K. G. *et al.*
- BISNOVATYI-KOGAN, G. S. / Angular Velocity Distribution in Convective Regions and the Origin of Solar Differential Rotation **128**, 299
- BOCHSLER, P., J. GEISS, and A. MAEDER / The Abundance of  $^3\text{He}$  in the Solar Wind - a Constraint for Models of Solar Evolution **128**, 203
- BOCHSLER, P., *see* Coplan, M. A. *et al.*
- BOGOD, V. M., A. N. KORZHAVIN, SH. B. AKHMEDOV, H. AURASS, J. HILDEBRANDT, and A. KRÜGER / On the Complex Spatial Structure of a Gradual Microwave Burst **129**, 351
- BÖHME, A. / A Study of the Spectrum and the Polarization of the Noise Storm Continua between 234 and 40 MHz **128**, 399
- BÖHME, A., *see* Aurass, H. *et al.*
- BONETTI, S., *see* Kovacs, T. *et al.*
- BONINO, G., *see* Cini Castagnoli, G. *et al.*
- BOUWER, S. D., *see* Pap, J. *et al.*
- BRAJŠA, R., *see* Vršnak, B. *et al.*
- BRANDENBURG, A., D. MOSS, G. RÜDIGER, and I. TUOMINEN / The Nonlinear Solar Dynamo and Differential Rotation: A Taylor Number Puzzle? **128**, 243
- BRANDT, P. N., W. SCHMIDT, and M. STEINEGGER / On the Umbra-Penumbra Area Ratio of Sunspots **129**, 191 (*Letter*)
- BRAUN, D. C. and T. L. DUVAL, JR. /  $p$ -Mode Absorption in the Giant Active Region of 10 March, 1989 **129**, 83
- BRAUN, D. C., *see* Lindsey, C.
- BROUWER, M. P. and C. ZWAAN / Sunspot Nests as Traced by a Cluster Analysis **129**, 221
- BROWN, J. C., *see* Aboudarham, J. *et al.*
- BROWN, J. C., *see* Karlický, M. *et al.*
- BROWN, J. C., *see* Petrovay, K. *et al.*

- BROWN, T. M. / An Inverse Method for *p*-Mode Scattering Measurements **128**, 133
- BUMBA, V., V. RUŠIN, and M. RYBANSKÝ / Large-Scale Distribution of Magnetic Fields, Green Corona and Prominences during an Extended Activity Cycle **128**, 253
- BUYUKLIEV, G., *see* Dermendjiev, V. *et al.*
- ÇAKMAK, H., *see* Ökten, A.
- CALLY, P. S., *see* Fiedler, R. A. S.
- CAMERON, A. C., *see* Jardine, M.
- CAMPANELLA, M., *see* Kovacs, T. *et al.*
- CANNON, A. T. and W. H. MARQUETTE / The Evolution and Orientation of Early Cycle 22 Active Regions **131**, 69
- CATALA, C., *see* Vigneron, C. *et al.*
- CATTADORI, C., *see* Kovacs, T. *et al.*
- CECCHET, G., *see* Kovacs, T. *et al.*
- CHANDRASEKHAR, T., J. N. DESAI, N. M. ASHOK, and J. M. PASACHOFF / Fabry-Pérot Line Profiles in the  $\lambda 5303$  Å and  $\lambda 6373$  Å Coronal Lines Obtained during the 1983 Indonesian Eclipse **131**, 25
- CHARGEISHVILI, B. B., *see* Pataraya, A. D. *et al.*
- CHENG, C. C., *see* Kundu, M. R. *et al.*
- CHENG, D. Y. / Anomalous Short-Period Pulsations in GOES Magnetometer Data before Solar Proton Events **131**, 395
- CHERNOV, G. P. / Whistlers in the Solar Corona and Their Relevance to Fine Structures of Type IV Radio Emission **130**, 75
- CINI CASTAGNOLI, G., G. BONINO, A. PROVENZALE, and M. SERIO / On the Solar Origin of the Thermoluminescence Profile of the GT14 Core **127**, 357
- COPLAN, M. A., K. W. OGILVIE, P. BOCHSLER, and J. GEISS / Space-Based Measurements of Elemental Abundances and Their Relation to Solar Abundances **128**, 195
- COURTAUD, D., G. DAMAMME, E. GENOT, M. VUILLEMIN, and S. TURCK-CHIEZE / Metallicity, Opacity Coefficients and the Solar Standard Model **128**, 49
- COX, A. N. / Periods and Stability of Solar *g*-Modes **128**, 123
- DAMAMME, G., *see* Courtaud, D. *et al.*
- DAO-GIBNER, L., *see* Feynman, J. *et al.*
- DAPPEN, W., Y. LEBRETON, and F. ROGERS / The Equation of State of the Solar Interior: a Comparison of Results from Two Competing Formalisms **128**, 35
- DARA, H. C., C. E. ALISSANDRAKIS, and S. KOUTCHMY / Velocity Pattern of Small Scale Magnetic Fields **126**, 403 (*Letter*) Erratum **128**, 431
- DAWSON, J. M., *see* McClements, K. G. *et al.*
- DE ASSIS, A. S., *see* de Azevedo, C. A. *et al.*
- DE AZEVEDO, C. A., A. S. DE ASSIS, H. SHIGUEOKA, and P. H. SAKANAKA / Discrete Alfvén Waves in Solar Loop Prominences **131**, 119
- DE BARI, A., *see* Kovacs, T. *et al.*
- DE JAGER, C. / An Explanation of the 'Granulation Boundary' in the HR Diagram **126**, 201
- DENNIS, B. R., *see* Sawant, H. S. *et al.*
- DERMENDJIEV, V., Y. SHOPOV, and G. BUYUKLIEV / Solar Activity in the Past and the Problem of Solar Dynamo **128**, 217
- DESAI, J. N., *see* Chandrasekhar, T. *et al.*
- DESCHHOFF, G. A. M. and E. J. ZELLER / Evidence of Individual Solar Proton Events in Antarctic Snow **127**, 333
- DETRACEY, B., *see* Tapping, K. F.
- DEUTSCH, M., *see* Kovacs, T. *et al.*
- DE VOLNAY, F. M., *see* Giraud-Héraud, Y. *et al.*
- DEZSÖ, L., *see* Kovács, Á.
- DOLLFUS, A. / High-Resolution Analysis of Solar Photospheric Oscillations **129**, 1
- DOMINGO, V., *see* Jiménez, A. *et al.*
- DONATI, A., *see* Kovacs, T. *et al.*
- DONATI, J.-F. and M. SEMEL / Zeeman-Doppler Imaging: a New Option for Magnetic Field Study of Ap and Solar-Type Stars **128**, 227
- DONNELLY, R. F. and L. C. PUGA / Thirteen-Day Periodicity and the Center-to-Limb Dependence of UV, EUV, and X-Ray Emission of Solar Activity **130**, 369
- DOYLE, J. G., *see* Keenan, F. P.
- DRYER, M., *see* Smith, Z.
- DRYER, M., *see* Smith, Z.
- DULK, G. A. / Interplanetary Particle Beams **130**, 139
- DUVALL, T. L., JR., *see* Braun, D. C.
- DWIVEDI, B. N. / Forbidden Line Ratios from Si VIII and S X Coronal Ions **131**, 49
- ELSTE, G. H. / Asymmetries in Limb Darkening Reanalyzed **126**, 37
- EMSLIE, A. G., *see* Li, P.
- ERUKHIMOV, L. M., *see* Genkin, L. G. *et al.*
- ESSER, R. and S. R. HABBAL / Spectral Line and White-Light Intensities in the Corona in the Presence of Propagating or Standing Shocks **129**, 153
- EVANS, R., *see* Gabriel, S. *et al.*
- FAIRBRIDGE, R. W., *see* Shirley, J. H. *et al.*
- FÁRNÍK, F., *see* García, H. A.
- FÁRNÍK, F., *see* Švestka, Z. *et al.*
- FEYNMAN, J. and S. B. GABRIEL / Period and Phase of the 88-Year Solar Cycle and the Maunder Minimum: Evidence for a Chaotic Sun **127**, 393
- FEYNMAN, J., T. P. ARMSTRONG, L. DAO-GIBNER, and S. SILVERMAN / Solar Proton Events during Solar Cycles 19, 20, 21 **126**, 385
- FEYNMAN, J., *see* Gabriel, S. *et al.*
- FIEDLER, R. A. S. and P. S. CALLY / Force and Energy Balance in the Transition Region Network **126**, 69
- FLETCHER, L., *see* Petrovay, K. *et al.*
- FLUDRA, A., *see* Sylwester, B. *et al.*

- FORBES, T. G., *see* Priest, E. R.  
 FORBES, T. G., *see* Priest, E. R.  
 FORGACH, S., *see* Howard, R. F. *et al.*  
 FREEDMAN, S. J., *see* Kovacs, T. *et al.*  
 FU, Q.-J., Y.-F. GONG, S.-Z. JIN, and R.-Y. ZHAO / Fine Structures in Solar Radio Bursts at a 21 cm Wavelength and Pulsation Modulation **130**, 161  
 FU, Q.-J., *see* Jin, S.-Z. *et al.*  
 FU, Q. J., *see* Li, C. S. *et al.*  
 FU, Q.-J., *see* Zhao, R.-Y. *et al.*  
 GABRIEL, S., R. EVANS, and J. FEYNMAN / Periodicities in the Occurrence Rate of Solar Proton Events **128**, 415  
 GABRIEL, S. B., *see* Feynman, J.  
 GALLORINI, M., *see* Kovacs, T. *et al.*  
 GARCIA, H. A. / Evidence for Solar-Cycle Evolution of North-South Flare Asymmetry during Cycles 20 and 21 **127**, 185  
 GARCIA, H. A. and F. FÁRNÍK / Stereoscopic Measurements of Flares from PHOBOS and GOES **131**, 137  
 GARCZYŃSKA, I. N. / Propagation of Sprays with Deceleration **131**, 129  
 GARY, G. A. and M. J. HAGYARD / Transformation of Vector Magnetograms and the Problems Associated with the Effects of Perspective and the Azimuthal Ambiguity **126**, 21  
 GAVRIN, V. N., A. M. PSUKOV, and G. T. ZATSEPIN / Neutrino Astrophysical Potentialities of a Large-Mass Modular Detector Based on Large Activated Inorganic Single Crystals **128**, 67  
 GAVRYUSEV, V., *see* Provost, J. *et al.*  
 GAVRYUSEVA, E., *see* Provost, J. *et al.*  
 GEISS, J., *see* Bochsler, P. *et al.*  
 GEISS, J., *see* Coplan, M. A. *et al.*  
 GENKIN, L. G., L. M. ERUKHIMOV, and B. N. LEVIN / Thermodiffusional Small-Scale Irregularities in the Plasma Turbulence Region and Solar Radio Spikes **128**, 423 (*Letter*)  
 GENOT, E., *see* Courtaud, D. *et al.*  
 GEORGAKILAS, A. A., C. E. ALISSANDRAKIS, and TH. G. ZACHARIADIS / Mass Motions Associated with H $\alpha$  Active Region Arch Structures **129**, 277  
 GERLEI, O., *see* Aboudarham, J. *et al.*  
 GERTH, E., *see* Haubold, H. J.  
 GIRAUD-HÉRAUD, Y., J. KAPLAN, F. M. DE VOLNAY, C. TAO, and S. TURCK-CHIEZE / WIMPS and Solar Evolution Code **128**, 21  
 GIZZATULLINA, S. M., V. D. RUKAVISHNIKOV, A. A. RUZMAIKIN, and K. S. TAVASTSHERNA / Radiocarbon Evidence of the Global Stochasticity of Solar Activity **127**, 281  
 GOMEZ, M. T., *see* Andretta, V. *et al.*  
 GONG, Y.-F., *see* Fu, Q.-J. *et al.*  
 GOOSSENS, M., *see* van der Linden, R. A. M.  
 GOPALSWAMY, N. / A Note on the Emission Mechanism of Storm Radiation **126**, 367  
 GOPALSWAMY, N. and M. R. KUNDU / Multiple Moving Magnetic Structures in the Solar Corona **128**, 377  
 GOPALSWAMY, N., *see* Kundu, M. R.  
 GOPALSWAMY, N., *see* Thejappa, G. *et al.*  
 GOUGH, D. O. and E. NOVOTNY / Sensitivity of Solar Eigenfrequencies to the Age of the Sun **128**, 143  
 GOUGH, D. O., *see* Balmforth, N. J.  
 GRAETER, M. / H $\alpha$  Line Profile Observations of a Limb Flare with High Temporal Resolution **130**, 337  
 GRANDPIERRE, A. / How Is the Sun Working? **128**, 3  
 HABBAL, S. R., *see* Esser, R.  
 HAGYARD, M. J., *see* Gary, G. A.  
 HAINES, M. G., *see* Simnett, G. M.  
 HARRISON, R. A. / The Source Regions of Solar Coronal Mass Ejections **126**, 185  
 HARRISON, R. A., *see* McClements, K. G. *et al.*  
 HARVEY, J. W., *see* Howard, R. F. *et al.*  
 HAUBOLD, H. J. and E. GERTH / On the Fourier Spectrum Analysis of the Solar Neutrino Capture Rate **127**, 347  
 HENOUX, J. C., *see* Aboudarham, J. *et al.*  
 HERAS, A. M., B. SANAHUJA, M. A. SHEA, and D. F. SMART / Some Comments on the East-West Solar Flare Distribution during the 1976-1985 Period **126**, 371  
 HIEI, E., *see* Suemoto, Z. *et al.*  
 HILDEBRANDT, J., *see* Bogod, V. M. *et al.*  
 HILL, F. / A Map of the Horizontal Flows in the Solar Convection Zone **128**, 321  
 HIRAYAMA, T., *see* Nishikawa, J.  
 HOOD, A. W. and U. ANZER / A Model for Quiescent Solar Prominences with Normal Polarity **126**, 117  
 HOWARD, R. F. / The Magnetic Fields of Active Regions. II: Rotation **126**, 299  
 HOWARD, R. F. / The Magnetic Fields of Active Regions. III: Growth and Decay of Magnetic Flux **131**, 239  
 HOWARD, R. F. / The Magnetic Fields of Active Regions. IV: Meridional Motions **131**, 259  
 HOWARD, R. F., J. W. HARVEY, and S. FORGACH / Solar Surface Velocity Fields Determined from Small Magnetic Features **130**, 295  
 HU, C.-M., *see* Jin, S.-Z. *et al.*  
 INZANI, P., *see* Kovacs, T. *et al.*  
 JACKSON, P. D., M. R. KUNDU, and N. KASSIM / Meter-Decimeter Observations of dMe Flare Stars with the Clark Lake Radio Telescope **130**, 391  
 JARDINE, M. and A. C. CAMERON / Magnetostatic Equilibria for Coronal Loops on Rotating Stars **131**, 269  
 JIMÉNEZ, A., M. ÁLVAREZ, N. B. ANDERSEN, V. DOMINGO, A. JONES, P. L. PALLÉ, and T. ROCA CORTES / Phase Differences between Luminosity and Velocity Measurements of the Acoustic Modes **126**, 1

- JIN, J.-H., *see* Ye, S.-H.
- JIN, S.-Z., Q.-J. FU, R.-Y. ZHAO, and C.-M. HU / Spike Observations in Flares in China **130**, 175
- JIN, S.-Z., *see* Fu, Q.-J. *et al*
- JIN, S.-Z., *see* Zhao, R.-Y. *et al*
- JONES, A., *see* Jiménez, A. *et al*
- KAPLAN, J., *see* Giraud-Héraud, Y. *et al*
- KARLICKÝ, M. / Pulse Beam Heating of the Solar Atmosphere **130**, 347
- KARLICKÝ, M., D. ALEXANDER, J. C. BROWN, and A. L. MACKINNON / Return Current and Collisional Effects in Nonthermal Electron Beams with Pulsed Injection **129**, 325
- KARLICKÝ, M., *see* Abrami, A. *et al*
- KARLICKÝ, M., *see* Aurass, H. *et al*
- KASSIM, N., *see* Jackson, P. D. *et al*
- KAY, J., *see* Kovacs, T. *et al*
- KEENAN, F. P. / N IV Line Ratios in the Sun **126**, 311
- KEENAN, F. P. / Theoretical Emission Line Strengths for Ne VII Compared to EUV Solar Observations **131**, 291
- KEENAN, F. P. and J. G. DOYLE / A Comparison of Theoretical S V Emission Line Strengths with Extreme Ultraviolet Observations of a Sunspot **128**, 345
- KLEORIN, N. I. and A. A. RUZMAIKIN / Large-Scale Flows Excited by Magnetic Fields in the Solar Convective Zone **131**, 211
- KOPP, R. A. and G. POLETTI / Formation and Cooling of the Giant HXIS Arches of November 6-7, 1980 **127**, 267
- KORZHAVIN, A. N., *see* Bogod, V. M. *et al*
- KOSUGI, T., *see* Bakunin, L. M. *et al*
- KOTOV, V. A. and T. T. TSAP / 160 Minute Solar Variations and the 22 Year Cycle **128**, 269
- KOUTCHMY, S., *see* Dara, H. C. *et al*
- KOUTCHMY, S., *see* Dara, H. C. *et al*
- KOUTCHMY, S., *see* Zirker, J. B.
- KOUTCHMY, S., *see* Zirker, J. B.
- KOVÁCS, Á. and L. DEZSŐ / An Analysis of Surges Triggered by a Small Flare **129**, 313
- KOVACS, T., J. MITCHELL, P. RAGHAVAN, R. S. RAGHAVAN, S. J. FREEDMAN, J. KAY, C. E. LANE, R. I. STEINBERG, C. CATTADORI, A. DONATI, S. PAKVASA, M. DEUTSCH, P. ROTHSCHILD, C. ARPESELLA, G. BELLINI, S. BONETTI, M. CAMPANELLA, P. INZANI, I. MANNO, E. MERONI, G. RANUCCI, F. RAGUSA, G. CECCHET, A. DE BARI, M. GALLORINI, and A. PEROTTI / Borex: Solar Neutrino Experiment via Weak Neutral and Charged Currents in Boron-11 **128**, 61
- KRÜGER, A., *see* Bogod, V. M. *et al*
- KUNDU, M. R. and N. GOPALSWAMY / Filament Eruption and Storm Radiation at Meter-Decameter Wavelengths **129**, 133
- KUNDU, M. R., C. C. CHENG, and E. J. SCHMAHL / UVSP and VLA Observations of the 24 June 1980 Flare: Asymmetric or Isotropic Beaming? **129**, 343
- KUNDU, M. R., *see* Gopalswamy, N.
- KUNDU, M. R., *see* Jackson, P. D. *et al*
- KUNDU, M. R., *see* Thejappa, G. *et al*
- KURTHS, J. and A. A. RUZMAIKIN / On Forecasting the Sunspot Numbers **126**, 407 (*Letter*)
- LABS, D., *see* Neckel, H.
- LABS, D., *see* Neckel, H.
- LANDI DEGL'INNOCENTI, E., *see* Arena, P. *et al*
- LANE, C. E., *see* Kovacs, T. *et al*
- LANG, J., H. E. MASON, and R. W. P. MCWHIRTER / The Interpretation of the Spectral Line Intensities from the CHASE Spectrometer on Spacelab 2 **129**, 31
- LA ROSA, T. N. / Impulsive Phase Heating by Unidirectional Current Systems in Solar Flares **126**, 153
- LATTARI, C. J. B., *see* Sawant, H. S. *et al*
- LEBRETON, Y., *see* Däppen, W. *et al*
- LEDENEV, V. G., *see* Bakunin, L. M. *et al*
- LEGRAND, J. P. and P. A. SIMON / A Two-Component Solar Cycle **131**, 187
- LEVIN, B. N., *see* Genkin, L. G. *et al*
- LI, C. S., Q. J. FU, and H. W. LI / Electron Beams and Associated Rapid Fluctuations in Solar Flares **131**, 337
- LI, H. W., *see* Li, C. S. *et al*
- LI, P. and A. G. EMSLIE / Comparison of Thermal and Nonthermal Hard X-Ray Emission in Electron-Heated Solar Flares **129**, 113
- LI, X.-C., *see* Zhao, R.-Y. *et al*
- LIN, R. P., *see* Aschwanden, M. J. *et al*
- LINDSEY, C. and D. C. BRAUN / Helioseismic Imaging of Sunspots at Their Antipodes **126**, 101
- LITVINENKO, YU. E. and B. V. SOMOV / Nonthermal Electrons in the Thick-Target Reverse-Current Model for Hard X-Ray Bremsstrahlung **131**, 319
- LIU, Y.-Y., *see* Zheng, L.-P.
- MACKINNON, A. L., *see* Karlický, M. *et al*
- MAEDER, A., *see* Bochsler, P. *et al*
- MAGUN, A., *see* Zhao, R.-Y. *et al*
- MANGENY, A., *see* Vigneron, C. *et al*
- MANNO, I., *see* Kovacs, T. *et al*
- MARIK, M., *see* Petrovay, K. *et al*
- MARQUETTE, W. H., *see* Cannon, A. T.
- MARQUETTE, W., *see* Zirin, H.
- MARTIN, S. F., *see* Schrijver, C. J.
- MASON, H. E., *see* Lang, J. *et al*
- MCCABE, M. K., *see* Sime, D. G.
- MCCLEMENTS, K. G., R. A. HARRISON, and D. ALEXANDER / The Detection of Wave Activity in the Solar Corona Using UV Line Spectra **131**, 41



- McCLEMENTS, K. G., J. J. SU, R. BINGHAM, J. M. DAWSON, and D. S. SPICER / Simulation Studies of Electron Acceleration by Ion Ring Distributions in Solar Flares **130**, 229
- MCINTOSH, P. S., *see* Poquérousse, M.
- MCINTOSH, P. S., *see* Wilson, P. R. *et al.*
- MCLEAN, D. J., *see* Bakunin, L. M. *et al.*
- MCWHIRTER, R. W. P., *see* Lang, J. *et al.*
- MELROSE, D. B. / Particle Beams in the Solar Atmosphere: General Overview **130**, 3
- MENDOZA, B., R. PÉREZ ENRÍQUEZ, and M. ALVAREZ-MADRIGAL / The Intense Solar Activity of March 1989 as a Precursor for the Occurrence of an ENSO by the End of 1989 **126**, 195
- MERCIER, C. / Polarisation of Type III Bursts between 164 and 435 MHz: Structure and Variation with Frequency **130**, 119
- MERONI, E., *see* Kovacs, T. *et al.*
- MERRYFIELD, W. J. / Azimuthal Convective Rolls and the Subsurface Magnetic Field **128**, 305
- MESSEROTTI, M., *see* Abrami, A. *et al.*
- MESSEROTTI, M., *see* Zlobec, P. *et al.*
- MITCHELL, J., *see* Kovacs, T. *et al.*
- MOREL, P., J. PROVOST, and G. BERTHOMIEU / Investigation on Numerical Accuracy of ZAMS Models of One Solar Mass **128**, 7
- MOSS, D., *see* Brandenburg, A. *et al.*
- MULLER, R., TH. ROUDIER, and J. VIGNEAU / The Large-Scale Pattern Formed by the Spatial Distribution of Granules **126**, 53
- MUSCHIETTI, L. / Electron Beam Formation and Stability **130**, 201
- NAKAGOMI, Y., *see* Suemoto, Z. *et al.*
- NECKEL, H. and D. LABS / The Role of Telescopic Stray Light in Limb-Darkening Scans Obtained in April 1981 (and Later) **126**, 47
- NECKEL, H. and D. LABS / Variations of 'Wave-lengths' and 'Bisector Indices' of 70 Solar Spectral Lines between 3300 and 3960 Å in Kitt Peak FTS Spectra **126**, 207
- NISHIKAWA, J. and T. HIRAYAMA / Facular Structures Derived from Precise Two-Color Contrast Observations **127**, 211
- NISHIKAWA, J., *see* Aini Kambry, M.
- NOCI, G., *see* Arena, P. *et al.*
- NOVOTNY, E., *see* Gough, D. O.
- OGLIVIE, K. W., *see* Coplan, M. A. *et al.*
- ÖKTEN, A. and H. ÇAKMAK / High Latitude Helical Surge of May 22, 1989 **128**, 365
- OSTRYAKOV, V. M. and I. G. USOSKIN / On the Dimension of Solar Attractor **127**, 405
- PAKVASA, S., *see* Kovacs, T. *et al.*
- PALLÉ, P. L., *see* Anguera Gubau, M. *et al.*
- PALLÉ P. L., *see* Jiménez, A. *et al.*
- PAP, J., W. K. TOBISKA, and S. D. BOUWER / Periodicities of Solar Irradiance and Solar Activity Indices. I **129**, 165
- PASACHOFF, J. M., *see* Chandrasekhar, T. *et al.*
- PATARAYA, A. D., A. L. TAKTAKISHVILI, and B. B. CHARGEISHVILI / The Formation of Spicules in the Course of the Chromospheric Network Magnetic Field Reconnection **128**, 333
- PELLING, R. M., *see* Aschwanden, M. J. *et al.*
- PÉREZ ENRÍQUEZ, R., *see* Mendoza, B. *et al.*
- PÉREZ HERNÁNDEZ, F., *see* Anguera Gubau, M. *et al.*
- PEROTTI, A., *see* Kovacs, T. *et al.*
- PETROVAY, K. and B. K. ABUZEID / Cluster Analysis of the Space-Time Distribution of Sunspot Groups during Solar Cycle No. 20 **131**, 231
- PETROVAY, K., J. C. BROWN, L. VAN DRIEL-GESZTELYI, L. FLETCHER, M. MARIK, and G. STEWART / Asymmetric Flux Loops in Active Regions, II **127**, 51
- PETROVAY, K., *see* van Driel-Gesztelyi, L.
- PICK, M. and G. H. J. VAN DEN OORD / Observations of Beam Propagation **130**, 83
- POLETTI, G. and Z. ŠVESTKA / Real-Time Simulation of a Potential Magnetic Field in a Post-Flare Arch **129**, 363
- POLETTI, G., *see* Kopp, R. A.
- POQUÉRUSSE, M. and P. S. MCINTOSH / Type III Radio Burst Productivity of Solar Flares: I. Release of Energetic Electrons out of the Flare Site **130**, 101
- PRIEST, E. R. and T. G. FORBES / Magnetic Field Evolution during Prominence Eruptions and Two-Ribbon Flares **126**, 319
- PRIEST, E. R. and T. G. FORBES / The Evolution of Coronal Magnetic Fields **130**, 399 (*Letter*)
- PRIEST, E. R., *see* Steele, C. D. C.
- PRIEST, E. R., *see* Vekstein, G. E. *et al.*
- PROVENZALE, A., *see* Cini Castagnoli, G. *et al.*
- PROVOST, J., G. BERTHOMIEU, E. GAVRYUSEVA, and V. GAVRYUSEV / Non-Equidistant Spectrum of Gravity Modes of a Solar Model with a Mixed Core **128**, 111
- PROVOST, J., *see* Morel, P. *et al.*
- PSHUKOV, A. M., *see* Gavrin, V. N. *et al.*
- PUGA, L. C., *see* Donnelly, R. F.
- RAGHAVAN, P., *see* Kovacs, T. *et al.*
- RAGHAVAN, S. R., *see* Kovacs, T. *et al.*
- RAGUSA, F., *see* Kovacs, T. *et al.*
- RANUCCI, G., *see* Kovacs, T. *et al.*
- ROCA CORTÉS, T., *see* Anguera Gubau, M. *et al.*
- ROCA CORTÉS, T., *see* Jiménez, A. *et al.*
- ROGERS, F., *see* Däppen, W. *et al.*
- ROSENTHAL, C. S. / Absorption of Acoustic Waves in Monolithic and Fibril Sunspot Models **130**, 313
- ROTHSCHILD, P., *see* Kovacs, T. *et al.*
- ROUDIER, TH., *see* Muller, R. *et al.*
- RUDERMAN, M. S. / Viscous Damping of Surface Magnetohydrodynamic Waves on Magnetic Interface in Cold Plasmas **131**, 11
- RÜDIGER, G., *see* Brandenburg, A. *et al.*
- RUKAVISHNIKOV, V. D., *see* Gizzatulina, S. M. *et al.*

- RUŠIN, V. and J. ZVERKO / Periodicities in the Green Corona for the Sun as a Star **128**, 261
- RUŠIN, V., *see* Bumba, V. *et al.*
- RUŽDIK, V., *see* Zlobec, P. *et al.*
- RUŽDIK, V., *see* Vršnak, B. *et al.*
- RUZMAIKIN, A. A., *see* Gizzatullina, S. M. *et al.*
- RUZMAIKIN, A. A., *see* Klecorin, N. I.
- RUZMAIKIN, A. A., *see* Kurths, J.
- RYBANSKÝ, M., *see* Bumba, V. *et al.*
- SAKANAKA, P. H., *see* de Azevedo, C. A. *et al.*
- SAHAJUA, B., *see* Heras, A. M. *et al.*
- SAWANT, H. S., C. J. B. LATTARI, A. O. BENZ, and B. R. DENNIS / Hard X-Rays and Associated Weak Decimetric Bursts **130**, 57
- SCHANDA, E., *see* Zhao, R.-Y. *et al.*
- SCHATZMAN, E., *see* Vigneron, C. *et al.*
- SCHLAMMINGER, L. / Aurorae Borealis Lag during the Maunder Minimum **131**, 411 (Letter)
- SCHLICKEISER, R., *see* Bech, F.-W. *et al.*
- SCHMAHL, E. J., *see* Kundu, M. R. *et al.*
- SCHMIDT, W., *see* Brandt, P. N. *et al.*
- SCHRIJVER, C. J. and S. F. MARTIN / Properties of the Large- and Small-Scale Flow Patterns in and around AR 19824 **129**, 95
- SCHWARTZ, R. A., *see* Aschwanden, M. J. *et al.*
- SEMED, M., *see* Donati, J.-F.
- SERIO, M., *see* Cini Castagnoli, G. *et al.*
- SEVERINO, G., *see* Andretta, V. *et al.*
- SHEA, M. A. and D. F. SMART / A Summary of Major Solar Proton Events **127**, 297
- SHEA, M. A., *see* Heras, A. M. *et al.*
- SHEELEY, N. R., JR. and Y.-M. WANG / Magnetic Field Configurations Associated with Fast Solar Wind **131**, 165
- SHIGUEOKA, H., *see* de Azevedo, C. A. *et al.*
- SHIRLEY, J. H., K. R. SPERBER, and R. W. FAIRBRIDGE / Sun's Inertial Motion and Luminosity **127**, 379
- SHOPOV, Y., *see* Dermendjiev, V. *et al.*
- SILVERMAN, S., *see* Feynman, J. *et al.*
- SIME, D. G. and M. K. MCCABE / The Structure of the White-Light Corona and the Large-Scale Magnetic Field **126**, 267
- SIMNETT, G. M. and M. G. HAINES / On the Production of Hard X-Rays in Solar Flares **130**, 253
- SIMON, P. A., *see* Legrand, J. P.
- SLOTTJE, C., *see* Allaart, M. A. F. *et al.*
- SMART, D. F., *see* Heras, A. M. *et al.*
- SMART, D. F., *see* Shea, M. A.
- SMITH, D. F. and A. O. BENZ / A Mechanism for Producing Plasma Radiation in the GigaHertz Range by Precipitating High-Energy Protons **131**, 351
- SMITH, Z. and M. DRYER / MHD Study of Temporal and Spatial Evolution of Simulated Interplanetary Shocks in the Ecliptic Plane within 1 AU **129**, 387
- SMITH, Z. and M. DRYER / Numerical Simulations of High-Speed Solar Wind Streams within 1 AU and Their Signatures at 1 AU **131**, 363
- SNODGRASS, H. B., *see* Wilson, P. R. *et al.*
- SOMOV, B. V., *see* Litvinenko, Yu. E.
- SONDAAR, L. H., *see* Allaart, M. A. F. *et al.*
- SPERBER, K. R., *see* Shirley, J. H. *et al.*
- SPICER, D. S., *see* McClements, K. G. *et al.*
- STEELE, C. D. C. and E. R. PRIEST / Thermal Equilibria of Coronal Magnetic Arcades **127**, 65
- STEELE, C. D. C., *see* Vekstein, G. E. *et al.*
- STEHLING, W., *see* Aschwanden, M. J. *et al.*
- STEINACKER, J., *see* Bech, F.-W. *et al.*
- STEINBERG, R. I., *see* Kovacs, T. *et al.*
- STEINEGGER, M., *see* Brandt, P. N. *et al.*
- STEWART, G., *see* Petrovay, K. *et al.*
- SU, J. J., *see* McClements, K. G. *et al.*
- SU, Q.-R. / Non-Isothermal Atmosphere, Solar Wind, Shearing and Pressing Magnetic Field and Preflare Loops **127**, 139
- SUEMOTO, Z., E. HIEI, and Y. NAKAGOMI / Continuous and Line Spectra of Granules and Intergranular Lanes **127**, 11
- ŠVESTKA, Z., F. FÁRNÍK, and F. TANG / X-Ray Bright Surges **127**, 149
- ŠVESTKA, Z., *see* Poletto, G.
- SYLWESTER, B., J. SYLWESTER, R. D. BENTLEY, and A. FLUDRA / Investigation of Non-Uniform Heating during the Decay Phase of Solar Flares **126**, 177
- SYLWESTER, J., *see* Sylwester, B. *et al.*
- TAKAKURA, T. / Steady Heat Conduction in Coronal Loop Unstable against Plasma Instability **127**, 95
- TAKTAKISHVILI, A. L., *see* Pataraya, A. D. *et al.*
- TANG, F., *see* Švestka, Z. *et al.*
- TAO, C., *see* Giraud-Héraud, Y. *et al.*
- TAPPING, K. F. and B. DETRACEY / The Origin of the 10.7 cm Flux **127**, 321
- TAVASTSHERNA, K. S., *see* Gizzatullina, S. M. *et al.*
- TERNULLO, M. / Sunspots: Their Rotation, Their Expansion in the Activity Zone, Their Links with the Giant Convective Cells **127**, 29
- THEJAPPA, G., N. GOPALSWAMY, and M. R. KUNDU / Microbursts at Meter-Decameter Wavelengths **127**, 165
- THOMPSON, R. / The 1989 Solar Terrestrial Predictions Workshop **127**, 207
- TOBISKA, W. K., *see* Pap, J. *et al.*
- TSAP, T. T., *see* Kotov, V. A.
- TUOMINEN, I., *see* Brandenburg, A. *et al.*
- TURCK-CHIEZE, S., *see* Giraud-Héraud, Y. *et al.*
- TURCK-CHIEZE, S., *see* Courtaud, D. *et al.*
- URALOV, A. M. / The Flare as a Result of Cross-Interaction of Loops: Causal Relationship with a Prominence **127**, 253
- USOSKIN, I. G., *see* Ostryakov, V. M.
- VANDAKUROV, Y. V. / Can Variations of Sunspot Number Be Related to Those of the Solar Neutrino Flux? **131**, 407 (Letter)



- VAN DEN OORD, G. H. J., *see* Aboudarham, J. *et al.*  
 VAN DEN OORD, G. H. J., *see* Pick, M.  
 VAN DER LINDEN, R. A. M. and M. GOOSSENS / Thermal Instability in Slab Geometry in the Presence of Anisotropic Thermal Conduction **131**, 79  
 VAN DRIEL-GESZTELYI, L. and K. PETROVAY / Asymmetric Flux Loops in Active Regions: I **126**, 285  
 VAN DRIEL-GESZTELYI, L., *see* Aboudarham, J. *et al.*  
 VAN DRIEL-GESZTELYI, L., *see* Petrovay, K. *et al.*  
 VAN NIEUWKOOP, J., *see* Allaart, M. A. F. *et al.*  
 VEKSTEIN, G. E., E. R. PRIEST, and C. D. C. STEELE / Magnetic Reconnection and Energy Release in the Solar Corona by Taylor Relaxation **131**, 297  
 VENKATAKRISHNAN, P. / Loss of Magnetic Tension in Pre-Flare Magnetic Configurations **128**, 371  
 VENKATESAN, D. and B. Y. ZHU / On the High-Speed Plasma Streams, Stormtime Sudden Commencements and Cosmic-Ray Intensity: Relation amongst Them during Epoch 1978 to 1982 **131**, 385  
 VIGNEAU, J., *see* Muller, R. *et al.*  
 VIGNERON, C., A. MANGENEY, C. CATALA, and E. SCHATZMAN / Angular Momentum Transport in Pre-Main-Sequence Stars of Intermediate Mass **128**, 287  
 VRŠNAK, B. / Eruptive Instability of Cylindrical Prominences **129**, 295  
 VRŠNAK, B. / Dynamics and Internal Structure of an Eruptive Prominence **127**, 129  
 VRŠNAK, B., V. RUŽDIAK, R. BRAJŠA, and F. ZLOCH / Oscillatory Motions in an Active Prominence **127**, 119  
 VRŠNAK, B., *see* Zlobec, P. *et al.*  
 VUILLEMIN, M., *see* Courtaud, D. *et al.*  
 WANG, H., H. ZIRIN, and G. AI / Magnetic Flux Transport of Decaying Active Regions and Enhanced Magnetic Network **131**, 53  
 WANG, Y.-M., *see* Sheeley, N. R., Jr.  
 WATANABE, T. / Plasma Motions in the Flare of 1982 June 6 (X12) **126**, 351  
 WEBB, G. M. and G. P. ZANK / Application of the Sine-Poisson Equation in Solar Magnetostatics **127**, 229  
 WILSON, P. R., P. S. MCINTOSH, and H. B. SNODGRASS / The Reversal of the Solar Polar Magnetic Fields. I: The Surface Transport of Magnetic Flux **127**, 1  
 WILSON, R. M. / On the Maximum Rate of Change in Sunspot Number Growth and the Size of the Sunspot Cycle **127**, 199  
 WOOD, W. P. / Resonant Oscillations in Sunspot Umbrae **128**, 353  
 YE, S.-H. and J.-H. JIN / A Diagnostic Method for Probing the Possible Twist of Magnetic Field Lines in Sunspots **129**, 247  
 ZACHARIADIS, TH. G., *see* Georgakilas, A. A. *et al.*  
 ZANK, G. P., *see* Webb, G. M.  
 ZATSEPIN, G. T., *see* Gavrin, V. N. *et al.*  
 ZELLER, E. J., *see* Deschhoff, G. A. M.  
 ZHAO, R.-Y., A. MAGUN, and E. SCHANDA / On the Relation between the Peak Frequency and the Corresponding Rise Time of Solar Microwave Impulsive Bursts and the Height Dependence of Magnetic Fields **130**, 361  
 ZHAO, R.-Y., S.-Z. JIN, Q.-J. FU, and X.-C. LI / MHD Oscillations in Radio Spike Radiation Observed on May 16, 1981 **130**, 151  
 ZHAO, R.-Y., *see* Fu, Q.-J. *et al.*  
 ZHAO, R.-Y., *see* Jin, S.-Z. *et al.*  
 ZHENG, L.-P. and Y.-Y. LIU / On the Interpretation of the 2.84 GHz Solar UFFS Data of May 16, 1981 **129**, 127  
 ZHU, B. Y., *see* Venkatesan, D.  
 ZIRIN, H. and W. MARQUETTE / BEARALERTS: A Successful Flare Prediction System **131**, 149  
 ZIRIN, H., *see* Wang, H. *et al.*  
 ZIRKER, J. B. and S. KOUTCHMY / Prominence Fine Structure **127**, 109  
 ZIRKER, J. B. and S. KOUTCHMY / Prominence Fine Structure. II: Diagnostics **131**, 107  
 ZLOBEC, P., V. RUŽDIAK, B. VRŠNAK, M. KARLICKÝ, and M. MESSEROTTI / The Role of the Magnetic Field in Intensity and Geometry in the Type III Burst Generation **130**, 31  
 ZLOBEC, P., *see* Abrami, A. *et al.*  
 ZLOCH, F., *see* Vršnak, B. *et al.*  
 ZVERKO, J., *see* Rušin, V.  
 ZWAAN, C., *see* Brouwer, M. P.

